THE NATIONAL SAFETY COMPETITIONS OF 1944-1947

BY FORREST T. MOYER, JOSEPH H. SCHUSTER,
J. I. DAVIS, AND E. K. ELSNER

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THE NATIONAL SAFETY COMPETITION

General Discussion

The National Safety Competition conducted by the Bureau of Mines, United States Department of the Interior, is held each year for the purpose of promoting safety in the mineral industries of the United States. Since the program was inaugurated in 1925, twenty-three safety competitions have been held. This publication is a report of the results of the contests held in 1944, 1945, 1946, and 1947. The names of plants that have been awarded "Sentinels of Safety" trophies and Certificates of Achievement in Safety during these years, together with a summary of their achievements in injury prevention, are listed. Statistical data covering the injury experience of all plants entered in the annual contests also are included in this publication. The injury statistics of these plants, arranged in the six groups of the competition, are the only data on injury severity at mineral operations available to the Bureau of Mines.

Interest in the National Safety Competition has increased steadily. The number of participating plants has increased from 210 in 1925, the first year of the competition, to the record number of 494 in 1946. The widening scope of the competition means that a steadily increasing number of the mines and quarries in the United States are participating in a program that will supplement their other activities in promoting safety. Safety competitions have long been recognized as instrumental in stimulating and holding the interest of employees and officials in accident-prevention work.

During the 4 years covered by this report, conditions in the mineral industries of the United States were hardly conducive to setting records in accident prevention. During the war years, handicaps were especially severe-loss of skilled employees to the armed forces or to higher-wage war industries, greater production by a smaller force of workers, relatively high rates of labor turn-over, the longer workday in effect through 1944 and 1945, and difficulties in obtaining repairs and replacement for badly worn machinery. Even the immediate postwar period has brought no abatement of the tremendous pressure upon the mineral industries for greater production. Although there was a decrease of 18 in 1947 from the record enrollment in 1946, these operations worked 160,525,025 man-hours, the greatest number of man-hours of exposure to mining hazards in any year of the contest except 1942.

Despite the accelerated pace at which the mineral industry worked during the 4 years covered by this report, participants in the National Safety Competition have achieved creditable performances in the promotion of safety. In fact, the injury-severity rate in the enrolled plants in the 1947 contest was 7.315 days for each thousand man-hours worked, the lowest by far in the history of the National Safety Competition. The injury-frequency rate of 42.155 for each million man-hours of exposure to mine hazards in 1947 marks a favorable trend downward from the rate of 50.577 in 1946, which was the highest since 1933. Perhaps the record low injury-severity rate and the greatly lowered injury-frequency rate are indicative of the fact that the mineral industries are beginning to overcome the difficulties under which they operated during the war and in the reconversion period.

Progress in accident prevention is reflected clearly in the records of the plants that participated in these competitions through the years. Futhermore, statistics of the competitions show that the average plant enrolled in them has a better safety record than the average mine or quarry in the country. The National Safety Competition has been an effective means of promoting accident-prevention work in the mines and quarries of the country.

Program

The National Safety Competition has for its sole purpose the promotion of safety in the mineral industries of the United States. It provides, at plant level, the opportunity for management and labor to cooperate in a program designed to increase the effectiveness of accident-prevention work in the mine or quarry. Winners are given awards in recognition of their accomplishments in the promotion of safety in their plants. Each competition provides the participating plant a powerful incentive to better its performance of the previous year. Interest and enthusiasm engendered by participation in this Nation-wide competition furnishes an additional stimulus for cooperation between the officials and employees of a plant in the maintenance of an effective program of injury prevention.

In the National Safety Competition, participating plants are classified in six industry groups, as follows:

1. Anthracite group, underground anthracite mines. (A change in contest rules in 1947 eliminates all surface man-hours and injuries from consideration in the competition.)

2. Bituminous-coal group, underground bituminous-coal mines, including the surface operations of the mines.

3. Metal group, underground metal mines, including the surface operations of the mines.

4. Nonmetal group, underground nonmetal mines, including underground quarries and the surface operations of the mines.

5. Open-pit group, open pits mining anthracite and bituminous coal, metals, and nonmetals.

6. Quarry group, plants that recover stone materials from open quarries, including crushing operations.

This method of classification insures, insofar as possible, that the plants in each group have similar operating conditions and as a result face the same kind of mining hazards. Thus, enrolled plants are provided equality of opportunity in the competition for trophies.

Six bronze trophies known as "Sentinels of Safety" have been provided by The Explosives Engineer Magazine. These are awarded each year by the Bureau of Mines to the contestant that has the best safety record in each of the six groups. The trophies are retained by the winners for 1 year as a token of recognition of their achievements in injury prevention in their plants. They are transferred when new winners have been determined in competition the following year. The names of the trophy winners are engraved on the pedestals of the trophies.

In addition to the trophies awarded to the first-place contestant in each group, each employee of the winning mine or quarry receives a Certificate of Achievement in Safety issued by the Bureau of Mines for his personal contribution to the accomplishment of his plant. Certificates of Achievement in Safety are awarded to the contestants that rank second, third, fourth, and fifth in each group and to all plants that have operated for the year without a lost-time injury.

The rules of eligibility governing the competition provide that participating plants must have underground, quarry, or pit workings that have been active for at least 100 days and that have worked at least 30,000 man-hours during the year to be eligible for "Sentinels of Safety" trophies. In this computation of days-active and man-hours worked, all surface work is excluded. Plants that cannot meet this minimum requirement can not win trophies, but they can win Certificates of Achievement in Safety if the total volume of employment at the mine or quarry, including surface work, is at least 30,000 man-hours and if no lost-time injuries have been incurred during the year. Noncommercial mines or quarries, such as those operated by a Federal, State, or municipal agency, are not eligible for the award of the trophy but are given Certificates of Achievement in Safety for compiling injury-free records.

Method of Rating

The determination of the relative standing of mines and quarries enrolled in the competition is based upon their injury-severity rates. The severity rate is defined as the number of days of disability that result from all injuries for each thousand man-hours of exposure. The mine or quarry with the lowest severity rate is declared the winner in its group. If two or more mines or quarries have identical severity rate, that with the greatest number of man-hours worked is given precedence. When two or more mines or quarries have no lost-time injuries, the plant having the largest number of man-hours of exposure to mine hazards during the year receives the award.

In the computation of severity rates, each temporary injury is charged with the number of calendar days on which the employee was physically unable to work. Deaths and permanent injuries are weighted in accordance with the schedules prescribed by the American Standards Association. The severity rate is derived by dividing the total number of days of disability from injuries by the total number of man-hours worked and multiplying the quotient by 1,000.

Committee of Award

The rules governing the National Safety Competition specify that the records of the leading contestants for the "Sentinels of Safety" trophies shall be sent to a Committee of Award, which, after evaluation of the individual records, will select the trophy winners. This committee is composed of seven members, none of whom are officially connected with the Bureau of Mines. They serve because they are keenly interested in promoting safety in the mineral industries of the United States.

The members of the Committee of Award, as it is now constituted, are:

Ned H. Dearborn, president, National Safety Council
Julian D. Conover, secretary, American Mining Congress
J. D. Battle, executive secretary, National Coal Association
William Green, president, American Federation of Labor
A. J. R. Curtis, assistant secretary and safety director, Portland Cement Association
A. T. Goldbeck, engineering director, National Crushed Stone Association
Dan H. Harrington, consulting mining engineer

Objectives of the Competition

The National Safety Competition stimulates and maintains interest in the promotion of safety in the mineral industries of the United States in many ways. The following are a few of its important functions:

1. The competition affords an opportunity for mines and quarries to cooperate in a program designed to supplement the usual methods of promoting safety. Enrollment in the competition encourages employees and officials of participating plants to cooperate in furthering accident-prevention work.

2. The fact that each contestant can compare the safety record of his plant with that of other plants in the same industry gives him definite criteria by which to evaluate his own performance. Knowledge of his position can serve as a starting point for constructive effort on his part.

3. The records of the contest provide the Bureau of Mines with additional statistical data concerning the nature and causes of accidents in the mineral industries. Publication of reports based upon a study of these data will provide information that can be utilized advantageously by all concerned with injury prevention in industry.

Plan of This Report

The Committee of Award selected the winners of "Sentinels of Safety" trophies immediately after the conclusion of each year's contest. These winners, as well as the winners of Certificates of Achievement in Safety, were announced promptly in press releases. This publication presents the statistical data that served as the basis for determining winners.

In presenting the records of injury experience of the enrolled plants, each industry-group, arranged in alphabetical order, will be allocated a separate section in this report. Each of these six sections will be divided as follows: The list of all winners of awards during the past 4 years, a table summarizing the injury experience of the group as a unit over the 23-year period, and, finally, the individual records of injury experience of each entrant in the competitions during the past 4 years. Summary tables that apply to all mines and quarries enrolled in the National Safety Competition are grouped together in the final section of this publication.

ANTHRACITE GROUP

Summary

The Butler mine of the Jermyn-Green Coal Co., Pittston, Luzerne County, Pa., won the "Sentinels of Safety" trophy for the third successive year in 1947. This outstanding performance establishes a new safety record in the anthracite group, for in the history of the National Safety Competition no other contestant has retained possession of the trophy for 3 consecutive years.

Because of a change in contest rules at the beginning of the competition of 1947, it is not possible to compare the injury experience of the anthracite group in 1947 directly with the experience of previous years. This change, affecting only the anthracite group, provides that only underground injuries and underground working time will be considered computing the safety records of mines in the group. The new provision eliminates the obvious inequalities that existed in the past when large surface cleaning plants and other surface installations were included in the records of the mines where they were located. It is quite significant, however, to note that the underground workings of the 45 anthracite mines enrolled in 1947 had an injury-severity rate of 8.881, the lowest since 1926, despite the exclusion of surface data from consideration.

During the past 4 years the number of entrants in the anthracite group has declined steadily from the record 55 in 1944 to 45 in 1947. The total number of man-hours worked by entrants declined correspondingly, although the great decrease in 1947 is partly explainable by the fact that all surface data were excluded for the first time in that year. Although the severity rate for the group was extremely favorable in 1947, the injury experience for the group in 1945 and 1946 was unfavorable. In both years the severity rates were higher than the 23-year averages.

Table 1 summarizes the injury experience of the group for the 23 years of the National Safety Competition. Tables 2A, 2B, 2C, and 2D present the injury experience of each mine, in order of rank in the contest, enrolled in the National Safety Competitions of 1947, 1946, 1945, and 1944, respectively. Mines in the anthracite group that won "Sentinels of Safety" trophies and Certificates of Achievement in Safety in the competitions of the past four years are listed below.

Awards in the Competitions, 1947-44

The winners of "Sentinels of Safety" trophies in the anthracite group were as follows:

1947

Butler mine, Pittston, Luzerne County, Pa., operated by the Jermyn-Green Coal Co., 231,070 man-hours with 3 lost-time injuries that caused 42 days of disability. The injury-severity rate was 0.182

1946

Butler mine, Pittston, Luzerne County, Pa., operated by the Jermyn-Green Coal Co., 267,708 man-hours with 8 lost-time injuries that caused 29 days of disability. The injury-severity rate was 0.108.

1945

Butler mine, Pittston, Luzerne County, Pa., operated by the Jermyn-Green Coal Co., 232,950 man-hours with 11 lost-time injuries that caused 71 days of disability. The injury-severity rate was 0.305.

1944

Miles Slope mine, Dickson City, Lackawanna County, Pa., operated by The Hudson Coal Co., 229,496 man-hours with 3 lost-time injuries that caused 12 days of disability. The injury-severity rate was 0.052.

The winners of Certificates of Achievement in Safety in the anthracite group were as follows:

1947

Baltimore No. 5 mine, Wilkes-Barre, Luzerne County, Pa., operated by The Hudson Coal Co., 468,392 man-hours with 24 lost-time injuries that caused 467 days of disability. The injury-severity rate was 0.997.

Blue Ridge mine, Archbald, Lackawanna County, Pa., operated by the Ace Coal Co., 40,089 man-hours with 3 lost-time injuries that caused 41 days of disability. The injury-severity rate was 1.023.

Beaver Meadows mine, Beaver Meadows, Carbon County, Pa., operated by the Haddock Mining Co., 692,979 man-hours with 64 lost-time injuries that caused 866 days of disability. The injury-severity rate was 1.250.

Beaver Valley mine, Shamokin, Northumberland County, Pa., operated by the Level Coal Mining Co., 50,991 man-hours with 3 lost-time injuries that caused 78 days of disability. The injury-severity rate was 1.530.

1946

Hunter Tunnel mine, Girardville, Schuylkill County, Pa., operated by the Philadelphia & Reading Coal & Iron Co., 118,020 man-hours with 2 lost-time injuries that caused 23 days of disability. The injury-severity rate was 0.195.

Bear Valley mine, Shamokin, Northumberland County, Pa., operated by the Level Coal Mining Co., 54,853 man-hours with 6 lost-time injuries that caused 56 days of disability. The injury-severity rate was 1.021.

Eckley mine, Eckley, Luzerne County, Pa., operated by Jeddo-Highland Coal Co., 389,645 man-hours with 28 lost-time injuries that caused 554 days of disability. The injury-severity rate was 1.422.

No. 14 mine, Plainsville, Luzerne County, Pa., operated by Jermyn-Green Coal Co., 1,665,937 man-hours with 156 lost-time injuries that caused 3,087 days of disability. The injury-severity rate was 1.853.

1945

Baltimore Tunnel mine, Wilkes-Barre, Luzerne County, Pa., operated by The Hudson Coal Co., 208,483 man-hours with 9 lost-time injuries that caused 231 days of disability. The injury-severity rate was 1.108.

No. 6 mine, Pittston, Luzerne County, Pa., operated by the Jermyn-Green Coal Co., 1,427,353 man-hours with 99 lost-time injuries that caused 1,784 days of disability. The injury-severity rate was 1.250.

Ebervale mine, Ebervale, Luzerne County, Pa., operated by Jeddo-Highland Coal Co., 306,597 man-hours with 30 lost-time injuries that causes 433 days of disability. The injury-severity rate was 1.412.

Stockton mine, Stockton, Luzerne County, Pa., operated by Jeddo-Highland Coal Co., 321,967 man-hours with 35 lost-time injuries that caused 460 days of disability. The injury-severity rate was 1.429.

1944

Oregon Slope mine, Pittston, Luzerne County, Pa., operated by Morgan Coal Co., 42,854 man-hours without a lost-time injury.

Midvalley mine, Wilburton, Columbia County, Pa., operated by Hazle Brook Coal Co., 171,068 man-hours with 2 lost-time injuries that caused 66 days of disability. The injury-severity rate was 0.386.

Eddie & Joe No. 2 mine, Forest City, Susquehanna County, Pa., operated by Eddie & Joe Coal Co., 63,973 man-hours with 3 lost-time injuries that caused 27 days of disability. The injury-severity rate was 0.422.

Olyphant mine, Olyphant, Lackawanna County, Pa., operated by Ace Coal Co., 69,440 man-hours with 5 lost-time injuries that caused 38 days of disability. The injury-severity rate was 0.547.

TABLE 1. - Injury experience of ANTHRACITE group in the National Safety Competition, 1925-47, by years 1/

Year	Number of mines	Man-hours	Number of injuries 2/					Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925	8	4,890,295	5	-	1	457	463	30,000	-	600	6,782	37,382	94.677	7.644
1926	25	23,880,435	20	-	23	2,296	2,339	120,000	-	22,400	35,852	178,252	97.946	7.464
1927	23	25,544,466	32	-	22	2,489	2,543	192,000	-	19,950	41,625	253,575	99.552	9.927
1928	22	22,844,885	32	-	26	1,955	2,013	192,000	-	16,950	40,471	249,421	88.116	10.918
1929	29	31,098,493	42	-	21	3,089	3,152	252,000	-	20,550	55,991	328,541	101.355	10.565
1930	27	27,830,952	33	3	26	2,981	3,043	198,000	18,000	30,100	54,048	300,148	109.339	10.785
1931	21	15,704,908	20	1	13	1,295	1,329	120,000	6,000	10,500	21,075	157,575	84.623	10.033
1932	26	16,588,413	23	1	8	1,650	1,682	138,000	6,000	4,500	33,431	181,931	101.396	10.967
1933	33	23,038,407	23	3	28	2,340	2,394	138,000	18,000	32,100	53,179	241,279	103.913	10.473
1934	27	16,526,073	19	1	16	1,275	1,311	114,000	6,000	18,000	30,251	168,251	79.329	10.181
1935	37	24,475,637	34	3	22	1,698	1,757	204,000	18,000	23,250	44,241	289,491	71.786	11.828
1936	32	24,285,465	28	2	30	1,731	1,791	168,000	12,000	34,350	51,242	265,592	73.748	10.936
1937	24	17,930,535	27	2	17	1,516	1,562	162,000	12,000	10,950	48,104	233,054	87.114	12.998
1938	4/25	14,662,038	16	2	23	1,230	1,271	96,000	12,000	10,800	41,443	160,243	86.686	10.929
1939	25	16,579,352	28	2	16	1,158	1,204	168,000	12,000	14,700	37,771	232,471	72.620	14.022
1940	34	16,243,827	18	-	21	1,239	1,278	108,000	-	20,492	40,510	169,002	78.676	10.404
1941	32	17,119,048	15	1	32	1,304	1,352	90,000	6,000	34,050	36,481	166,531	78.976	9.728
1942	35	21,258,497	26	1	25	1,892	1,944	156,000	6,000	22,505	59,259	243,764	91.446	11.467
1943	41	26,237,230	36	2	29	2,242	2,309	216,000	12,000	25,050	58,994	312,044	88.005	11.893
1944	55	40,519,360	40	2	38	3,454	3,534	240,000	12,000	31,800	85,235	369,035	87.218	9.108
1945	51	35,515,847	45	-	31	3,088	3,164	270,000	-	28,500	86,051	384,551	89.087	10.828
1946	46	37,384,815	45	1	46	3,312	3,404	270,000	6,000	48,450	82,969	407,419	91.053	10.898
1947	45	28,982,287	28	-	39	2,617	2,684	168,000	-	26,101	63,281	257,382	92.608	8.881
Total	-	529,141,265	635	27	553	46,308	47,523	3,810,000	162,000	506,648	1,108,286	5,586,934	89.812	10.558

1/ Data for 1947 competition contain only underground man-hours and injuries; data for previous years contain surface, breaker, shop and yard, and underground man-hours and injuries.

2/ P.T., permanent total disability; P.P. permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days lost from injuries per thousand man-hours.

4/ Omitting the entire record of 1 mine, in which 8 lives were lost in a single disaster.

TABLE 2A. - Injury experience of each ANTHRACITE mine enrolled in the National Safety Competition 1947 1/

Rank	Man-hours worked	Number of injuries					Average days of disability per temp. injury	Number of days of disability					Frequency rate	Severity rate
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	231,070	-	-	-	3	3	14	-	-	-	42	42	12.983	0.182
2	468,392	-	-	-	24	24	19	-	-	-	467	467	51.239	.997
3	40,089	-	-	-	3	3	14	-	-	-	41	41	74.833	1.023
4	692,979	-	-	-	64	64	14	-	-	-	866	866	92.355	1.250
5	50,991	-	-	-	3	3	26	-	-	-	78	78	58.834	1.530
6	820,341	-	-	-	75	75	17	-	-	-	1,300	1,300	91.425	1.585
7	292,117	-	-	-	42	42	11	-	-	-	470	470	143.778	1.609
8	156,856	-	-	-	15	15	18	-	-	-	267	267	95.629	1.702
9	682,134	-	-	2	54	56	20	-	-	150	1,105	1,255	82.095	1.840
10	993,764	-	-	-	97	97	19	-	-	-	1,873	1,873	97.609	1.885
11	345,681	-	-	-	23	23	29	-	-	-	667	667	66.535	1.930
12	527,259	-	-	-	46	46	22	-	-	-	1,022	1,022	87.244	1.938
13	661,227	-	-	1	46	47	26	-	-	150	1,199	1,349	71.080	2.040
14	356,968	-	-	-	37	37	21	-	-	-	786	786	103.651	2.202
15	126,133	-	-	-	16	16	18	-	-	-	281	281	126.850	2.228
16	638,975	-	-	-	32	32	51	-	-	-	1,642	1,642	50.080	2.570
17	1,265,271	-	-	3	114	117	25	-	-	750	2,862	3,612	92.470	2.855
18	661,471	-	-	3	37	40	40	-	-	413	1,492	1,905	60.471	2.880
19	1,012,888	-	-	-	84	84	35	-	-	-	2,938	2,938	82.931	2.901
20	1,040,347	-	-	1	157	158	20	-	-	150	3,117	3,267	151.872	3.140
21	541,457	-	-	1	44	45	36	-	-	150	1,581	1,731	83.109	3.197
22	84,350	-	-	1	1	2	25	-	-	300	25	325	23.711	3.853
23	417,173	-	-	3	45	48	25	-	-	600	1,115	1,715	115.060	4.111
24	107,373	-	-	-	19	19	30	-	-	-	561	561	176.953	5.225
25	266,329	-	-	-	41	41	34	-	-	-	1,409	1,409	153.945	5.290
26	1,254,929	1	-	-	82	83	19	6,000	-	-	1,575	7,575	66.139	6.036
27	369,404	-	-	1	36	37	29	-	-	1,800	1,045	2,845	100.161	7.702
28	809,431	1	-	-	15	16	33	6,000	-	-	493	6,493	19.767	8.022
29	771,996	1	-	-	53	54	14	6,000	-	-	749	6,749	69.949	8.742
30	2,206,036	2	-	4	289	295	21	12,000	-	2,550	6,120	20,670	133.724	9.370
31	1,872,889	2	-	4	118	124	31	12,000	-	2,175	3,622	17,797	66.208	9.502
32	963,686	1	-	1	74	76	24	6,000	-	1,800	1,756	9,556	78.864	9.916
33	624,407	1	-	-	41	42	24	6,000	-	-	994	6,994	67.264	11.201
34	567,944	-	-	3	54	57	21	-	-	6,375	1,116	7,491	100.362	13.190
35	2,089,008	4	-	3	246	253	21	24,000	-	750	5,043	29,793	121.110	14.262
36	1,001,854	2	-	3	92	97	29	12,000	-	900	2,682	15,582	96.820	15.553
37	281,938	-	-	1	18	19	16	-	-	4,500	294	4,794	67.391	17.004
38	767,516	2	-	-	64	66	21	12,000	-	-	1,358	13,358	85.992	17.404
39	1,084,002	2	-	2	73	77	63	12,000	-	2,363	4,581	18,944	71.033	17.476
40	746,417	2	-	1	122	125	21	12,000	-	150	2,605	14,755	167.467	19.768
41	296,782	1	-	-	46	47	13	6,000	-	-	613	6,613	158.365	22.282
42	402,257	2	-	-	33	35	31	12,000	-	-	1,031	13,031	87.009	32.395
43	121,513	1	-	-	4	5	20	6,000	-	-	79	6,079	41.148	50.028
44	240,664	2	-	-	24	26	8	12,000	-	-	189	12,189	108.034	50.647
45	27,979	1	-	1	11	13	12	6,000	-	75	130	6,205	464.634	221.773
Total and averages 1947	28,982,287	28	-	39	2,617	2,684	24	168,000	-	26,101	63,281	257,382	92.608	8.881

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed. Beginning with 1947, only the injuries and man-hours of underground workings are considered in the contest for anthracite mines.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

TABLE 2B. - Injury experience of each ANTHRACITE mine enrolled in the National Safety Competition of 1946 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	267,708	-	-	-	8	8	4	-	-	-	29	29	29.883	0.108
2	118,020	-	-	-	2	2	12	-	-	-	23	23	16.946	.195
3	54,853	-	-	-	6	6	9	-	-	-	56	56	109.383	1.021
4	389,645	-	-	1	27	28	15	-	-	150	404	554	71.860	1.422
5	1,665,937	-	-	-	156	156	20	-	-	-	3,087	3,087	93.641	1.853
6	1,092,301	-	-	1	83	84	21	-	-	300	1,744	2,044	76.902	1.871
7	576,711	-	-	1	41	42	20	-	-	300	839	1,139	72.827	1.975
8	998,151	-	-	1	99	100	20	-	-	150	1,968	2,118	100.185	2.122
9	357,714	-	-	-	32	32	24	-	-	-	775	775	89.457	2.167
10	442,448	-	-	-	36	36	28	-	-	-	1,010	1,010	81.365	2.283
11	503,519	-	-	1	55	56	19	-	-	150	1,043	1,193	111.217	2.369
12	910,609	-	-	1	57	58	39	-	-	150	2,232	2,382	63.694	2.616
13	1,014,734	-	-	1	119	120	24	-	-	300	2,799	3,099	118.258	3.054
14	181,006	-	-	-	28	28	20	-	-	-	566	566	154.691	3.127
15	396,593	-	-	-	57	57	29	-	-	-	1,657	1,657	143.724	4.178
16	408,412	-	-	1	45	46	22	-	-	750	993	1,743	112.631	4.268
17	49,252	-	-	-	9	9	24	-	-	-	214	214	182.734	4.345
18	1,545,275	1	-	-	72	73	19	6,000	-	-	1,378	7,378	47.241	4.775
19	1,598,251	1	-	-	101	102	18	6,000	-	-	1,843	7,843	63.820	4.907
20	2,405,395	1	-	3	129	133	42	6,000	-	6,000	5,407	17,407	55.292	7.237
21	984,256	1	-	-	59	60	27	6,000	-	-	1,613	7,613	60.960	7.735
22	1,133,146	1	-	1	85	87	31	6,000	-	150	2,621	8,771	76.777	7.740
23	854,607	1	-	1	80	82	14	6,000	-	300	1,118	7,418	95.951	8.680
24	2,237,382	2	-	1	228	231	31	12,000	-	300	7,136	19,436	103.246	8.687
25	893,535	1	-	4	76	81	23	6,000	-	1,050	1,747	8,797	90.651	9.845
26	2,727,494	3	-	4	316	323	29	18,000	-	3,600	9,082	30,682	118.424	11.249
27	1,367,646	2	-	1	108	111	32	12,000	-	150	3,457	15,607	81.161	11.412
28	1,357,951	2	-	3	151	156	23	12,000	-	1,200	3,503	16,703	114.879	12.300
29	67,923	-	-	2	10	12	27	-	-	600	272	872	176.671	12.838
30	1,236,550	2	-	5	134	141	28	12,000	-	4,500	3,773	20,273	114.027	16.395
31	393,647	1	-	-	23	24	21	6,000	-	-	494	6,494	60.968	16.497
32	805,579	2	-	-	59	61	26	12,000	-	-	1,530	13,530	75.722	16.795
33	744,374	2	-	-	42	44	15	12,000	-	-	633	12,633	59.110	16.971
34	441,091	1	-	1	81	83	17	6,000	-	75	1,414	7,489	188.170	16.978
35	598,846	1	-	2	92	95	27	6,000	-	2,400	2,457	10,857	158.638	18.130
36	702,084	2	-	-	60	62	19	12,000	-	-	1,119	13,119	88.309	18.686
37	1,048,039	2	-	4	79	85	23	12,000	-	6,375	1,811	20,186	81.104	19.261
38	341,538	1	-	-	44	45	16	6,000	-	-	686	6,686	131.757	19.576
39	1,148,717	3	-	2	73	78	20	18,000	-	5,700	1,441	25,141	67.902	21.886
40	973,227	3	-	1	91	95	36	18,000	-	300	3,257	21,557	97.613	22.150
41	481,182	2	-	-	49	51	17	12,000	-	-	831	12,831	105.989	26.666
42	234,409	1	-	-	25	26	21	6,000	-	-	524	6,524	110.917	27.832
43	363,520	1	-	1	35	37	11	6,000	-	4,500	399	10,899	101.783	29.982
44	408,242	1	1	-	31	33	33	6,000	6,000	-	1,018	13,018	80.834	31.888
45	705,076	2	-	2	94	98	27	12,000	-	9,000	2,581	23,581	138.992	33.445
46	158,220	2	-	-	25	27	15	12,000	-	-	385	12,385	170.648	78.277
Totals and averages 1946	37,384,815	45	1	46	3,312	3,404	25	270,000	6,000	48,450	82,969	407,419	91.053	10.898
1945	35,515,847	45	-	31	3,088	3,164	28	270,000	-	28,500	86,051	384,551	89.087	10.828

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

TABLE 2C. - Injury experience of each ANTHRACITE mine enrolled in the National Safety Competition of 1945 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	232,950	-	-	-	11	11	6	-	-	-	71	71	47.220	0.305
2	208,483	-	-	-	9	9	26	-	-	-	231	231	43.169	1.108
3	1,427,353	-	-	-	99	99	18	-	-	-	1,784	1,784	69.359	1.250
4	306,597	-	-	-	30	30	14	-	-	-	433	433	97.848	1.412
5	321,967	-	-	-	35	35	13	-	-	-	460	460	108.707	1.429
6	52,094	-	-	-	3	3	25	-	-	-	76	76	57.588	1.459
7	704,674	-	-	-	48	48	26	-	-	-	1,234	1,234	68.117	1.751
8	860,063	-	-	-	72	72	25	-	-	-	1,801	1,801	83.715	2.094
9	179,333	-	-	-	19	19	21	-	-	-	401	401	105.948	2.236
10	1,402,576	-	-	2	92	94	29	-	-	600	2,700	3,300	67.020	2.353
11	950,460	-	-	1	59	60	35	-	-	300	2,045	2,345	63.127	2.467
12	156,296	-	-	-	21	21	19	-	-	-	389	389	134.360	2.489
13	25,515	-	-	-	4	4	16	-	-	-	64	64	156.771	2.508
14	57,426	-	-	-	14	14	11	-	-	-	151	151	243.792	2.629
15	40,152	-	-	-	3	3	35	-	-	-	106	106	74.716	2.640
16	393,703	-	-	-	23	23	46	-	-	-	1,052	1,052	58.420	2.672
17	659,042	-	-	-	68	68	27	-	-	-	1,825	1,825	103.180	2.769
18	406,049	-	-	-	45	45	28	-	-	-	1,241	1,241	110.824	3.056
19	407,762	-	-	-	33	33	38	-	-	-	1,256	1,256	80.930	3.080
20	166,887	-	-	-	17	17	34	-	-	-	573	573	101.865	3.433
21	406,833	-	-	-	63	63	26	-	-	-	1,618	1,618	154.855	3.977
22	694,920	-	-	-	78	78	36	-	-	-	2,811	2,811	112.243	4.045
23	336,923	-	-	1	34	35	28	-	-	750	963	1,713	103.881	5.084
24	421,660	-	-	3	51	54	28	-	-	900	1,429	2,329	128.065	5.523
25	32,417	-	-	-	1	1	190	-	-	-	190	190	30.848	5.861
26	1,167,691	1	-	-	71	72	25	6,000	-	-	1,800	7,800	61.660	6.680
27	1,464,708	1	-	-	179	180	31	6,000	-	-	5,498	11,498	122.891	7.850
28	835,703	-	-	1	59	60	43	-	-	4,500	2,540	7,040	71.796	8.424
29	894,481	1	-	2	76	79	22	6,000	-	600	1,641	8,241	88.319	9.213
30	2,333,846	3	-	1	116	120	29	18,000	-	300	3,346	21,646	51.417	9.275
31	55,922	-	-	-	9	9	70	-	-	-	633	633	160.938	11.319
32	555,321	1	-	-	33	34	24	6,000	-	-	776	6,776	61.226	12.202
33	582,140	1	-	-	47	48	28	6,000	-	-	1,327	7,327	82.454	12.586
34	2,618,941	4	-	2	273	279	34	24,000	-	1,950	9,212	35,162	106.532	13.426
35	1,030,193	2	-	-	75	77	31	12,000	-	-	2,310	14,310	74.743	13.891
36	508,465	1	-	1	45	47	23	6,000	-	300	1,028	7,328	92.435	14.412
37	594,380	1	-	-	61	62	45	6,000	-	-	2,731	8,731	104.310	14.689
38	582,795	1	-	-	84	85	35	6,000	-	-	2,962	8,962	145.849	15.378
39	1,333,815	3	-	1	107	111	23	18,000	-	300	2,482	20,782	83.220	15.581
40	490,836	1	-	-	56	57	30	6,000	-	-	1,661	7,661	116.128	15.608
41	1,111,166	2	-	3	160	165	30	12,000	-	1,500	4,727	18,227	148.493	16.403
42	1,251,866	3	-	2	118	123	19	18,000	-	600	2,280	20,880	98.253	16.679
43	894,251	2	-	2	91	95	22	12,000	-	1,200	1,958	15,158	106.234	16.950
44	1,374,495	3	-	2	84	89	24	18,000	-	4,350	1,993	24,343	64.751	17.711
45	2,183,412	5	-	3	186	194	24	30,000	-	5,100	4,503	39,603	88.852	18.138
46	378,398	1	-	1	41	43	18	6,000	-	300	733	7,033	113,637	18.586
47	738,365	2	-	1	42	45	41	12,000	-	1,800	1,730	15,530	60.945	21.033
48	847,310	3	-	-	83	86	16	18,000	-	-	1,319	19,319	101.498	22.800
49	532,171	2	-	-	34	36	27	12,000	-	-	920	12,920	67.647	24.278
50	248,213	1	-	1	21	23	45	6,000	-	750	954	7,704	92.662	31.038
51	54,828	-	-	1	5	6	17	-	-	2,400	83	2,483	109.433	45.287
Totals and averages 1945	35,515,847	45	-	31	3,088	3,164	28	270,000	-	28,500	86,051	384,551	89.087	10.828
1944	40,519,360	40	2	38	3,454	3,534	25	240,000	12,000	31,800	85,235	369,035	87.218	9.108

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ **Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure**; severity rate indicates number of days of disability **from injuries per thousand man-hours.**

TABLE 2D. - Injury experience of each ANTHRACITE mine enrolled in the National Safety Competition 1944 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	42,854	-	-	-	-	-	-	-	-	-	-	-	0.000	4/0.000
2	229,496	-	-	-	3	3	4	-	-	-	12	12	13.072	.052
3	171,068	-	-	-	2	2	33	-	-	-	66	66	11.691	.386
4	63,973	-	-	-	3	3	9	-	-	-	27	27	46.895	.422
5	432,140	-	-	-	7	7	34	-	-	-	236	236	16.198	5/ .546
6	69,440	-	-	-	5	5	8	-	-	-	38	38	72.005	.547
7	155,981	-	-	-	10	10	10	-	-	-	103	103	64.110	.660
8	466,305	-	-	-	42	42	12	-	-	-	512	512	90.070	1.098
9	281,092	-	-	-	16	16	21	-	-	-	336	336	56.921	1.195
10	1,440,493	-	-	1	71	72	21	-	-	300	1,471	1,771	49.983	1.229
11	174,370	-	-	-	15	15	15	-	-	-	222	222	86.024	1.273
12	1,618,358	-	-	1	122	123	15	-	-	300	1,853	2,153	76.003	1.330
13	1,574,201	-	-	1	142	143	14	-	-	300	2,002	2,302	90.840	1.462
14	639,325	-	-	-	42	42	27	-	-	-	1,114	1,114	65.694	1.742
15	1,037,630	-	-	-	80	80	26	-	-	-	2,046	2,046	77.099	1.972
16	611,400	-	-	-	59	59	24	-	-	-	1,414	1,414	96.500	2.313
17	646,852	-	-	1	66	67	15	-	-	600	970	1,570	103.579	2.427
18	622,806	-	-	-	50	50	34	-	-	-	1,724	1,724	80.282	2.768
19	600,706	-	-	-	67	67	25	-	-	-	1,670	1,670	111.535	2.780
20	2,577,694	-	-	2	260	262	26	-	-	600	6,732	7,332	101.641	2.844
21	459,917	-	-	-	58	58	26	-	-	-	1,528	1,528	126.110	3.322
22	390,152	-	-	-	61	61	21	-	-	-	1,304	1,304	156.349	3.342
23	399,167	-	-	1	40	41	17	-	-	750	690	1,440	102.714	3.608
24	316,129	-	-	1	31	32	29	-	-	300	910	1,210	101.225	3.828
25	57,855	-	-	-	8	8	28	-	-	-	226	226	138.277	3.906
26	267,628	-	-	-	32	32	35	-	-	-	1,134	1,134	119.569	4.237
27	590,104	-	-	1	61	62	22	-	-	1,800	1,343	3,143	105.066	5.326
28	596,512	-	-	1	57	58	27	-	-	1,800	1,522	3,322	97.232	5.569
29	1,442,924	1	-	-	97	98	29	6,000	-	-	2,851	8,851	67.918	6.134
30	838,639	-	-	3	115	118	25	-	-	2,400	2,909	5,309	140.704	6.330
31	344,081	-	-	1	32	33	13	-	-	1,800	413	2,213	95.908	6.432
32	1,351,504	1	-	-	126	127	24	6,000	-	-	2,975	8,975	93.969	6.641
33	1,231,889	1	-	2	77	80	22	6,000	-	900	1,681	8,581	64.941	6.966
34	36,533	-	-	-	1	1	259	-	-	-	259	259	27.373	7.089
35	831,391	-	-	2	54	56	28	-	-	4,800	1,520	6,320	67.357	7.602
36	984,949	1	-	1	70	72	18	6,000	-	300	1,233	7,533	73.100	7.648
37	1,339,555	1	-	2	146	149	28	6,000	-	600	4,068	10,668	111.231	7.964
38	938,938	1	-	-	77	78	40	6,000	-	-	3,108	9,108	83.073	9.700
39	551,482	-	-	1	25	26	38	-	-	4,500	946	5,446	47.145	9.875
40	748,368	1	-	1	85	87	16	6,000	-	300	1,372	7,672	116.253	10.252
41	1,070,132	2	-	-	66	68	20	12,000	-	-	1,321	13,321	63.544	12.448
42	868,658	1	-	-	152	153	35	6,000	-	-	5,339	11,339	176.134	13.053
43	2,329,313	4	-	4	249	257	22	24,000	-	1,200	5,523	30,723	110.333	13.190
44	1,276,877	2	-	2	90	94	30	12,000	-	2,400	2,690	17,090	73.617	13.384
45	2,355,171	5	-	-	167	172	29	30,000	-	-	4,764	34,764	73.031	14.761
46	483,645	-	1	-	25	26	50	-	6,000	-	1,256	7,256	53.758	15.003
47	1,063,368	2	-	3	86	91	21	12,000	-	2,400	1,828	16,228	85.577	15.261
48	823,668	2	-	1	34	37	67	12,000	-	300	2,270	14,570	44.921	17.689
49	1,147,282	5	-	2	84	91	23	30,000	-	1,050	1,916	32,966	79.318	28.734
50	450,003	2	-	-	38	40	26	12,000	-	-	974	12,974	88.888	28.831
51	41,384	-	-	1	1	2	66	-	-	1,200	66	1,266	48.328	30.592
52	746,816	3	1	2	67	73	21	18,000	6,000	900	1,395	26,295	97.748	35.209
53	184,918	1	-	-	25	26	22	6,000	-	-	545	6,545	140.603	35.394
54	466,788	3	-	-	53	56	14	18,000	-	-	751	18,751	119.969	40.170
55	37,436	1	-	-	2	3	29	6,000	-	-	57	6,057	80.137	161.796
Totals and averages 1944	40,519,360	40	2	38	3,454	3,534	25	240,000	12,000	31,800	85,235	369,035	87.218	9.108
1943	26,237,230	36	2	29	2,242	2,309	31	216,000	12,000	25,050	58,994	312,044	88.005	11.893

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

4/ Mine is not eligible for trophy because of failure to meet contest rules requiring at least 25 men employed underground for not less than 100 days and 30,000 man-hours of employment.

5/ Mine is not eligible for Certificate of Honorable Mention because it is chiefly a surface operation.

BITUMINOUS-COAL GROUP

Summary

Winners of trophies in the bituminous-coal group in three of the four years covered by this report have operated without a lost-time injury. The Winton No. 1 and 7½ mine of The Union Pacific Coal Co., at Winton, Sweetwater County, Wyo., achieved a particularly outstanding record in winning the trophy in 1947. This mine operated 587,342 man-hours without a disabling injury.

The group record for the past four contest years is quite favorable. The injury-frequency rates in the period are well below the 23-year average for the group, whereas the severity rates, except in 1945, are likewise below average. In 1947 the group had an injury-severity rate of 8.397, the lowest for the group in the history of the competition. And, in the same year, the injury-frequency rate of 37.043 for the group was the lowest in any year except 1940.

There was a phenomenal growth in enrollment in the group between 1944 and 1946, when the number of entrants jumped from 83 to 160. However, enrollment fell to 137 in 1947. Despite the drop in number of participating mines, the contestants operated a total of 74,805,108 man-hours, which is much higher than that of any previous contest year.

The injury experience of the bituminous-coal group for the 23 years of the National Safety Competition is summarized in table 3. Tables 4A, 4B, 4C, and 4D record the injury experience of each mine, in order of rank in the contest, enrolled in the National Safety Competitions of 1947, 1946, 1945, and 1944 respectively. Mines in the bituminous-coal group that won "Sentinels of Safety" trophies and Certificates of Achievement in Safety in the competitions of the past 4 years are listed below.

Awards in the Competitions, 1947-44

The winners of "Sentinels of Safety" trophies in the bituminous-coal group were as follows:

1947

Winton No. 1 & 7½ mine, Winton, Sweetwater County, Wyo., operated by The Union Pacific Coal Co., 587,342 man-hours without a lost-time injury.

1946

Bankhead No. 2 mine, Bankhead, Walker County, Ala., operated by the Consolidated Coal Co., 79,737 man-hours without a lost-time injury.

1945

Rockhill No. 5 mine, Robertsdale, Huntingdon County, Pa., operated by the Rockhill Coal Co., 289,924 man-hours with 1 lost-time injury that caused 54 days of disability. The injury-severity rate was 0.186.

1944

"D" Superior mine, Superior, Sweetwater County, Wyo., operated by The Union Pacific Coal Co., 81,650 man-hours without a lost-time injury.

The winners of Certificates of Achievement in Safety in the Bituminous-coal group were as follows:

1947

Rockhill No. 5 mine, Robertsdale, Huntingdon County, Pa., operated by the Rockhill Coal Co., 248,431 man-hours without a lost-time injury.

Boggs Run mine, Wheeling, Marshall County, W. Va., operated by the Boggs Run Mining Co., 37,362 man-hours without a lost-time injury.

Banknead No. 2 mine, Bankhead, Walker County, Ala., operated by the Consolidated Coal Co., 35,666 man-hours without a lost-time injury.

Winifrede mine, South Williamson, W. Va., Pike County, Ky., operated by the Pond Creek Colliery of the N. & W. Railway Co., 113,146 man-hours with 3 lost-time injuries that caused 21 days of disability. The injury-severity rate was 0.186.

1946

Asco No. 2 mine, Asco, McDowell County, W. Va., operated by Atlantic Smokeless Coal Co., 34,688 man-hours with 1 lost-time injury that caused 1 day of disability. The injury-severity rate was 0.029.

Freeport mine, South Williamson, W. Va., Pike County, Ky., operated by Pond Creek Colliery of the N. & W. Railway Co., 216,036 man-hours with 3 lost-time injuries that caused 11 days of disability. The injury-severity rate was 0.051.

No. 1 mine, Willard, Carter County, Ky., operated by Moore Branch Coal Co., 76,719 man-hours with 2 lost-time injuries that caused 9 days of disability. The injury-severity rate was 0.117.

Reliance No. 1 mine, Reliance, Sweetwater County, Wyo., operated by The Union Pacific Coal Co., 691,584 man-hours with 2 lost-time injuries that caused 122 days of disability. The injury-severity rate was 0.176.

1945

Bankhead No. 2 mine, Bankhead, Walker County, Ala., operated by Consolidated Coal Co., 132,651 man-hours with 1 lost-time injury that caused 25 days of disability. The injury-severity rate was 0.188.

Patton Clay No. 1 mine, Patton, Cambria County, Pa., operated by Patton Clay Manufacturing Co., 37,665 man-hours with 1 lost-time injury that caused 14 days of disability. The injury-severity rate was 0.372.

Rockhill No. 1 mine, Robertsdale, Huntingdon County, Pa., operated by Rockhill Coal Co., 291,980 man-hours with 2 lost-time injuries that caused 116 days of disability. The injury-severity rate was 0.397.

Midlothian mine, Dudley, Huntingdon County, Pa., operated by Blair Engineering & Supply Co., 227,628 man-hours with 9 lost-time injuries that caused 94 days of disability. The injury-severity rate was 0.413.

1944

Blue Gem mine, Mountain Ash, Whitley County, Ky., operated by Jellico Coal Mining Co., 69,190 man-hours without a lost-time injury.

No. 7½ mine, Winton, Sweetwater County, Wyo., operated by The Union Pacific Coal Co., 582,017 man-hours with 1 lost-time injury that caused 23 days of disability. The injury-severity rate was 0.040.

Hanna No. 4A mine, Hanna, Carbon County, Wyo., operated by The Union Pacific Coal Co., 940,923 man-hours with 3 lost-time injuries that caused 159 days of disability. The injury-severity rate was 0.169.

Elcomb mine, Harlan, Harlan County, Ky., operated by Elcomb Coal Co., 158,240 man-hours with 4 lost-time injuries that caused 41 days of disability. The injury-severity rate was 0.259.

TABLE 3. - Injury experience of BITUMINOUS-COAL group in the National Safety Competition, 1925-47, by years.

Year	Number of Mines	Man-hours	Number of injuries 1/					Number of days of disability 1/					Frequency rate 2/	Severity rate 2/
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925	51	24,227,266	28	1	27	3,053	3,109	168,000	6,000	31,500	48,535	254,035	128.326	10.486
1926	52	26,436,344	34	1	22	1,731	1,788	204,000	6,000	30,750	42,298	283,048	67.634	10.707
1927	45	21,936,508	42	2	46	2,045	2,135	252,000	12,000	38,346	42,904	345,250	97.326	15.739
1928	66	29,308,391	41	1	64	2,384	2,490	246,000	6,000	51,060	62,453	365,513	84.959	12.471
1929	68	33,668,473	42	4	61	2,214	2,321	252,000	24,000	52,730	60,836	389,566	68.937	11.571
1930	3/68	26,332,753	47	1	34	1,911	1,993	282,000	6,000	23,788	48,983	360,771	75.685	13.700
1931	92	29,278,018	32	2	81	1,616	1,731	192,000	12,000	59,433	43,454	306,887	59.123	10.482
1932	95	30,486,893	31	-	64	1,497	1,592	186,000	-	41,510	47,738	275,248	52.219	9.028
1933	98	34,113,337	35	1	83	1,515	1,634	210,000	6,000	59,798	46,243	322,041	47.899	9.440
1934	4/99	38,239,192	32	1	81	1,680	1,794	192,000	6,000	73,080	58,318	329,398	46.915	8.614
1935	109	42,342,213	55	1	110	2,051	2,217	330,000	6,000	93,423	76,411	505,834	52.359	11.946
1936	90	42,710,398	41	1	136	1,711	1,889	246,000	6,000	93,175	63,830	409,005	44.228	9.576
1937	79	39,432,355	31	1	152	1,320	1,504	186,000	6,000	97,191	51,393	340,584	38.141	8.637
1938	5/84	32,010,583	41	2	114	1,136	1,293	246,000	12,000	81,894	53,073	392,967	40.393	12.276
1939	102	44,204,986	50	3	156	1,735	1,944	300,000	18,000	95,061	69,295	482,356	43.977	10.912
1940	92	47,616,142	58	5	156	1,530	1,749	348,000	30,000	110,627	60,251	548,878	36.731	11.527
1941	6/103	52,599,089	59	6	180	1,909	2,154	354,000	36,000	118,736	82,830	591,566	40.951	11.247
1942	122	66,924,394	101	4	222	3,756	4,083	606,000	24,000	176,295	121,220	927,515	61.009	13.859
1943	7/83	48,498,430	45	2	130	1,920	2,097	270,000	12,000	115,774	67,853	465,627	43.239	9.601
1944	83	49,461,856	57	3	95	1,859	2,014	342,000	18,000	86,546	69,697	516,243	40.718	10.437
1945	8/121	57,153,351	77	3	128	2,388	2,596	462,000	18,000	127,771	87,567	695,338	45.422	12.166
1946	160	67,358,832	70	10	108	2,849	3,037	420,000	60,000	101,138	104,626	685,764	45.087	10.181
1947	137	74,805,108	60	7	176	2,528	2,771	360,000	42,000	135,341	90,817	628,158	37.043	8.397
Total	-	959,144,912	1,109	62	2,426	46,338	49,935	6,654,000	372,000	1,894,967	1,500,625	10,421,592	52.062	10.866

1/ P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

2/ Frequency rate indicates the number of fatal, permanent, and other lost-time accidents per million man-hours of exposure; severity rate indicates number of days lost from accidents per thousand man-hours.

3/ Omitting the entire record of 1 mine, in which 73 lives were lost in a single disaster.

4/ Omitting the entire record of 1 mine, in which 17 lives were lost in a single disaster.

5/ Omitting the entire record of 2 mines, in which 16 lives were lost in 2 disasters.

6/ Omitting the entire record of 1 mine, in which 5 lives were lost in a single disaster.

7/ Omitting the entire record of 1 mine, in which 12 lives were lost in a single disaster.

8/ Omitting the entire record of 1 mine, in which 7 lives were lost in a single disaster.

TABLE 4A. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1947 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	587,342	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	248,431	-	-	-	-	-	-	-	-	-	-	-	0.000	.000
3	37,362	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	35,666	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	113,146	-	-	-	3	3	7	-	-	-	21	21	26.514	.186
6	45,974	-	-	-	3	3	3	-	-	-	10	10	65.254	.218
7	150,438	-	-	-	2	2	30	-	-	-	59	59	13.295	.392
8	1,070,270	-	-	1	12	13	39	-	-	150	473	623	12.146	.582
9	357,851	-	-	-	1	1	217	-	-	-	217	217	2.794	.606
10	405,094	-	-	1	9	10	12	-	-	150	105	255	24.686	.629
11	287,068	-	-	-	7	7	26	-	-	-	181	181	24.384	.631
12	1,341,020	-	-	2	9	11	54	-	-	450	487	937	8.203	.699
13	300,129	-	-	-	7	7	30	-	-	-	212	212	23.323	.706
14	255,188	-	-	-	3	3	68	-	-	-	205	205	11.756	.803
15	177,246	-	-	1	3	4	29	-	-	75	87	162	22.568	.914
16	910,101	-	-	1	32	33	24	-	-	75	770	845	36.260	.928
17	1,318,799	-	-	1	22	23	57	-	-	150	1,243	1,393	17.440	1.056
18	594,516	-	-	-	16	16	39	-	-	-	631	631	26.913	1.061
19	84,120	-	-	-	6	6	15	-	-	-	90	90	71.327	1.070
20	164,177	-	-	-	7	7	26	-	-	-	179	179	42.637	1.090
21	309,257	-	-	1	13	14	16	-	-	150	211	361	45.270	1.167
22	81,453	-	-	-	3	3	35	-	-	-	106	106	36.831	1.301
23	442,262	-	-	-	29	29	20	-	-	-	578	578	65.572	1.307
24	141,088	-	-	-	14	14	14	-	-	-	189	189	99.229	1.340
25	347,814	-	-	-	11	11	43	-	-	-	470	470	31.626	1.351
26	613,973	-	-	-	31	31	27	-	-	-	835	835	50.491	1.360
27	424,468	-	-	-	18	18	33	-	-	-	592	592	42.406	1.395
28	338,703	-	-	1	13	14	27	-	-	150	347	497	41.334	1.467
29	710,306	-	-	-	20	20	52	-	-	-	1,047	1,047	28.157	1.474
30	693,800	-	-	-	32	32	32	-	-	-	1,024	1,024	46.123	1.476
31	359,577	-	-	1	28	29	14	-	-	150	381	531	80.650	1.477
32	49,358	-	-	-	3	3	25	-	-	-	76	76	60.780	1.540
33	735,798	-	-	1	2	3	129	-	-	900	258	1,158	4.077	1.574
34	443,767	-	-	1	11	12	38	-	-	300	416	716	27.041	1.613
35	343,567	-	-	-	9	9	62	-	-	-	560	560	26.196	1.630
36	1,004,020	-	-	3	12	15	48	-	-	1,125	578	1,703	14.940	1.696
37	448,861	-	-	3	5	8	69	-	-	450	345	795	17.823	1.771
38	172,480	-	-	-	10	10	32	-	-	-	322	322	57.978	1.867
39	486,238	-	-	-	29	29	32	-	-	-	923	923	59.642	1.898
40	246,852	-	-	-	14	14	34	-	-	-	474	474	56.714	1.920
41	111,532	-	-	-	3	3	72	-	-	-	215	215	26.898	1.928
42	1,081,455	-	-	1	35	36	53	-	-	300	1,840	2,140	33.288	1.979
43	316,682	-	-	-	12	12	53	-	-	-	633	633	37.893	1.999
44	157,764	-	-	-	10	10	32	-	-	-	320	320	63.386	2.028
45	160,982	-	-	-	6	6	56	-	-	-	337	337	37.271	2.093
46	1,487,455	-	-	2	42	44	60	-	-	600	2,524	3,124	29.581	2.100
47	182,522	-	-	1	12	13	13	-	-	225	160	385	71.224	2.109
48	469,919	-	-	-	36	36	28	-	-	-	1,016	1,016	76.609	2.162
49	186,649	-	-	-	20	20	21	-	-	-	421	421	107.153	2.256
50	475,820	-	-	1	6	7	55	-	-	750	329	1,079	14.711	2.268
51	153,326	-	-	-	12	12	31	-	-	-	375	375	78.265	2.446
52	518,454	-	-	-	25	25	51	-	-	-	1,277	1,277	48.220	2.463
53	575,605	-	-	-	24	24	61	-	-	-	1,460	1,460	41.695	2.536
54	207,353	-	-	1	14	15	18	-	-	275	251	526	72.340	2.537
55	407,097	-	-	-	17	17	64	-	-	-	1,091	1,091	41.759	2.680
56	313,829	-	-	2	23	25	16	-	-	525	368	893	79.661	2.845
57	230,003	-	-	1	9	10	43	-	-	300	384	684	43.478	2.974
58	449,538	-	-	-	63	63	22	-	-	-	1,372	1,372	140.144	3.052
59	459,312	-	-	1	21	22	54	-	-	300	1,143	1,443	47.898	3.142
60	379,749	-	-	2	15	17	20	-	-	900	307	1,207	44.766	3.178
61	135,103	-	-	-	22	22	21	-	-	-	461	461	162.839	3.412
62	201,471	-	-	1	11	12	57	-	-	75	625	700	59.562	3.474
63	279,871	-	-	1	15	16	17	-	-	750	255	1,005	57.169	3.591
64	778,899	-	-	3	32	35	62	-	-	840	1,985	2,825	44.935	3.627
65	252,747	-	-	-	13	13	75	-	-	-	972	972	51.435	3.846
66	351,905	-	-	2	12	14	32	-	-	1,050	388	1,438	39.783	4.086
67	102,232	-	-	-	17	17	26	-	-	-	445	445	166.288	4.353
68	604,146	-	-	3	17	20	35	-	-	2,100	599	2,699	33.105	4.467
69	341,325	-	-	2	19	21	27	-	-	1,037	508	1,545	61.525	4.526
70	387,321	-	-	2	30	32	18	-	-	1,275	540	1,815	82.619	4.686
71	233,180	-	-	1	21	22	38	-	-	300	801	1,101	94.348	4.722
72	937,044	-	-	2	51	53	28	-	-	3,075	1,430	4,505	56.561	4.808
73	461,011	-	-	3	-	3	-	-	-	2,250	-	2,250	6.507	4.881
74	297,474	-	-	1	18	19	64	-	-	300	1,160	1,460	63.871	4.908
75	1,528,572	-	1	1	27	29	35	-	6,000	750	952	7,702	18.972	5.039
76	475,258	-	-	2	15	17	43	-	-	1,875	651	2,526	35.770	5.315

TABLE 4A. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1947 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries					Average days of disability per temp. injury	Number of days of disability					Frequency rate	Severity rate
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
77	722,469	-	-	3	23	26	29	-	-	3,375	672	4,047	35.988	5.602
78	1,195,001	-	-	2	16	18	57	-	-	6,000	915	6,915	15.063	5.787
79	40,892	-	-	-	4	4	62	-	-	-	247	247	97.819	6.040
80	2,355,099	1	-	7	36	44	53	6,000	-	6,450	1,897	14,347	18.683	6.092
81	1,308,093	1	-	-	52	53	39	6,000	-	-	2,020	8,020	40.517	6.131
82	1,218,629	1	-	2	25	28	42	6,000	-	450	1,062	7,512	22.977	6.164
83	624,814	-	-	3	8	11	34	-	-	3,600	270	3,870	17.605	6.194
84	57,999	-	-	-	10	10	39	-	-	-	392	392	172.417	6.759
85	921,585	1	-	-	5	6	99	6,000	-	-	496	6,496	6.511	7.049
86	745,264	-	1	-	-	1	-	-	6,000	-	-	6,000	1.342	8.051
87	967,885	1	-	3	17	21	68	6,000	-	750	1,156	7,906	21.697	8.168
88	939,368	-	1	3	29	33	36	-	6,000	675	1,058	7,733	35.130	8.232
89	972,448	1	-	2	44	47	44	6,000	-	225	1,926	8,151	48.332	8.382
90	936,651	1	-	4	31	36	29	6,000	-	1,050	902	7,952	38.435	8.490
91	527,660	-	-	1	2	3	81	-	-	4,500	162	4,662	5.685	8.835
92	821,562	-	-	5	6	11	83	-	-	7,050	499	7,549	13.389	9.189
93	893,159	1	-	-	100	101	25	6,000	-	-	2,474	8,474	113.082	9.488
94	693,997	1	-	2	19	22	28	6,000	-	300	531	6,831	31.700	9.843
95	1,434,654	1	-	4	45	50	29	6,000	-	7,380	1,327	14,707	34.852	10.251
96	615,104	1	-	-	19	20	19	6,000	-	-	358	6,358	32.515	10.336
97	484,373	-	-	1	-	1	-	-	-	5,100	-	5,100	2.065	10.529
98	706,576	1	-	1	35	37	39	6,000	-	75	1,371	7,446	52.365	10.538
99	716,338	1	-	1	52	54	29	6,000	-	300	1,528	7,828	75.383	10.928
100	760,206	1	-	4	1	6	38	6,000	-	2,370	38	8,408	7.893	11.060
101	542,258	1	-	-	1	2	70	6,000	-	-	70	6,070	3.688	11.194
102	715,644	1	-	2	23	26	63	6,000	-	600	1,443	8,043	36.331	11.239
103	566,539	1	-	-	17	18	25	6,000	-	-	426	6,426	31.772	11.343
104	536,355	1	-	-	8	9	25	6,000	-	-	197	6,197	16.780	11.554
105	1,095,781	1	-	3	52	56	29	6,000	-	5,175	1,527	12,702	51.105	11.592
106	1,228,900	2	-	1	17	20	55	12,000	-	1,800	937	14,737	16.275	11.992
107	1,488,888	1	1	10	61	73	29	6,000	6,000	4,269	1,767	18,036	49.030	12.114
108	388,863	-	-	2	1	3	40	-	-	4,680	40	4,720	7.715	12.138
109	1,030,117	1	-	4	47	52	41	6,000	-	4,875	1,950	12,825	50.480	12.450
110	984,837	2	-	1	33	36	41	12,000	-	300	1,346	13,646	36.554	13.856
111	528,964	1	-	1	4	6	108	6,000	-	900	430	7,330	11.343	13.857
112	589,156	-	-	3	13	16	71	-	-	7,500	929	8,429	27.157	14.307
113	454,091	1	-	-	9	10	58	6,000	-	-	522	6,522	22.022	14.363
114	233,681	-	-	1	24	25	17	-	-	3,000	415	3,415	106.983	14.614
115	1,288,456	3	-	1	48	52	47	18,000	-	150	2,248	20,398	40,358	15.831
116	928,171	2	-	4	28	34	62	12,000	-	1,275	1,744	15,019	36.631	16.181
117	1,054,890	2	-	12	26	40	34	12,000	-	4,450	873	17,323	37.919	16.422
118	404,024	1	-	-	21	22	37	6,000	-	-	771	6,771	54.452	16.759
119	699,669	1	-	3	27	31	17	6,000	-	5,685	456	12,141	44.307	17.352
120	362,100	1	-	-	21	22	23	6,000	-	-	477	6,477	60.757	17.887
121	373,416	1	-	-	43	44	21	6,000	-	-	897	6,897	117.831	18.470
122	1,359,111	4	-	-	39	43	30	24,000	-	-	1,159	25,159	31.368	18.511
123	392,750	1	-	2	16	19	47	6,000	-	675	756	7,431	48.377	18.920
124	583,337	1	1	1	17	20	35	6,000	6,000	300	587	12,887	34.285	22.092
125	775,865	1	1	7	14	23	45	6,000	6,000	5,280	633	17,913	29.644	23.088
126	277,810	1	-	1	9	11	54	6,000	-	300	488	6,788	39.595	24.434
127	283,778	1	-	1	9	11	86	6,000	-	300	770	7,070	38.763	24.914
128	236,319	1	-	-	9	10	61	6,000	-	-	553	6,553	42.316	27.729
129	233,509	1	-	-	12	13	41	6,000	-	-	491	6,491	55.672	27.798
130	463,131	2	-	3	11	16	39	12,000	-	525	424	12,949	34.547	27.960
131	269,688	1	-	2	4	7	21	6,000	-	1,680	85	7,765	25.956	28.793
132	556,614	3	-	6	71	80	12	18,000	-	4,245	848	23,093	143.726	41.488
133	123,459	-	1	-	11	12	11	-	6,000	-	120	6,120	97.198	49.571
134	119,628	1	-	-	2	3	14	6,000	-	-	28	6,028	25.078	50.390
135	112,155	1	-	1	1	3	31	6,000	-	300	31	6,331	26.749	56.449
136	213,572	2	-	1	20	23	32	12,000	-	300	642	12,942	107.692	60.598
137	79,571	1	-	1	6	8	23	6,000	-	3,000	139	9,139	100.539	114.853
Total and averages 1947	74,805,108	60	7	176	2,528	2,771	36	360,000	42,000	135,341	90,817	628,158	37.043	8.397
1946	67,358,832	70	10	108	2,849	3,037	37	420,000	60,000	101,138	104,626	685,764	45.087	10.181

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates the number of days of disability from injuries per thousand man-hours.

TABLE 4B. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1946 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	79,737	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	22,308	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	22,144	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	20,317	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	19,552	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	13,138	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	34,688	-	-	-	1	1	1	-	-	-	1	1	28.828	.029
8	216,036	-	-	-	3	3	4	-	-	-	11	11	13.887	.051
9	76,719	-	-	-	2	2	5	-	-	-	9	9	26.069	.117
10	691,584	-	-	-	2	2	61	-	-	-	122	122	2.892	.176
11	238,968	-	-	-	3	3	18	-	-	-	54	54	12.554	.226
12	707,740	-	-	-	1	1	175	-	-	-	175	175	1.413	.247
13	235,377	-	-	-	10	10	8	-	-	-	75	75	42.485	.319
14	374,513	-	-	1	3	4	20	-	-	150	61	211	10.681	.563
15	774,994	-	-	-	4	4	113	-	-	-	453	453	5.161	.585
16	209,098	-	-	-	4	4	32	-	-	-	128	128	19.130	.612
17	526,022	-	-	-	17	17	19	-	-	-	324	324	32.318	.616
18	45,790	-	-	-	3	3	10	-	-	-	29	29	65.516	.633
19	127,373	-	-	-	5	5	16	-	-	-	81	81	39.255	.636
20	1,074,679	-	-	-	14	14	49	-	-	-	690	690	13.027	.642
21	125,855	-	-	-	5	5	17	-	-	-	83	83	39.728	.659
22	263,451	-	-	-	4	4	45	-	-	-	180	180	15.183	.683
23	133,175	-	-	-	5	5	18	-	-	-	92	92	37.545	.691
24	232,493	-	-	-	6	6	27	-	-	-	161	161	25.807	.692
25	285,113	-	-	-	14	14	14	-	-	-	199	199	49.103	.698
26	392,325	-	-	-	5	5	56	-	-	-	281	281	12.745	.716
27	180,034	-	-	-	3	3	50	-	-	-	150	150	16.664	.833
28	58,527	-	-	-	2	2	25	-	-	-	50	50	34.172	.854
29	134,618	-	-	-	1	1	118	-	-	-	118	118	7.428	.877
30	365,862	-	-	-	11	11	30	-	-	-	328	328	30.066	.897
31	28,709	-	-	-	2	2	13	-	-	-	26	26	69.665	.906
32	1,046,281	-	-	1	13	14	52	-	-	300	678	978	13.381	.935
33	285,074	-	-	-	12	12	26	-	-	-	308	308	42.094	1.080
34	82,818	-	-	-	10	10	9	-	-	-	91	91	120.747	1.099
35	380,529	-	-	-	3	3	143	-	-	-	430	430	7.884	1.130
36	63,843	-	-	-	13	13	6	-	-	-	74	74	203.625	1.159
37	262,404	-	-	-	11	11	29	-	-	-	319	319	41.920	1.216
38	453,809	-	-	1	3	4	95	-	-	300	285	585	8.814	1.289
39	371,441	-	-	1	28	29	15	-	-	75	421	496	78.074	1.335
40	367,890	-	-	-	23	23	22	-	-	-	515	515	62.519	1.400
41	374,947	-	-	-	16	16	33	-	-	-	527	527	42.673	1.406
42	151,760	-	-	-	2	2	111	-	-	-	221	221	13.179	1.456
43	568,396	-	-	1	16	17	39	-	-	225	622	847	29.909	1.490
44	102,402	-	-	-	6	6	27	-	-	-	160	160	58.593	1.562
45	301,527	-	-	1	5	6	36	-	-	300	179	479	19.899	1.589
46	62,920	-	-	-	4	4	25	-	-	-	100	100	63.573	1.589
47	231,562	-	-	-	20	20	20	-	-	-	398	398	86.370	1.719
48	105,575	-	-	-	4	4	48	-	-	-	190	190	37.888	1.800
49	364,285	-	-	-	16	16	42	-	-	-	669	669	43.922	1.836
50	667,064	-	-	-	12	12	103	-	-	-	1,235	1,235	17.989	1.851
51	241,533	-	-	-	14	14	33	-	-	-	457	457	57.963	1.892
52	423,729	-	-	-	28	28	29	-	-	-	814	814	66.080	1.921
53	315,011	-	-	-	15	15	40	-	-	-	607	607	47.617	1.927
54	650,322	-	-	-	27	27	47	-	-	-	1,261	1,261	41.518	1.939
55	695,388	-	-	1	34	35	23	-	-	600	780	1,380	50.332	1.985
56	65,914	-	-	-	16	16	9	-	-	-	138	138	242.741	2.094
57	283,959	-	-	-	12	12	50	-	-	-	596	596	42.260	2.099
58	325,332	-	-	-	12	12	58	-	-	-	693	693	36.885	2.130
59	81,423	-	-	-	6	6	30	-	-	-	178	178	73.689	2.186
60	383,386	-	-	-	14	14	61	-	-	-	852	852	36.517	2.222
61	171,797	-	-	-	8	8	49	-	-	-	390	390	46.567	2.270
62	396,765	-	-	1	15	16	50	-	-	150	756	906	40.326	2.283
63	817,738	-	-	-	26	26	73	-	-	-	1,903	1,903	31.795	2.327
64	208,468	-	-	1	21	22	17	-	-	150	364	514	105.532	2.466
65	65,291	-	-	-	5	5	32	-	-	-	161	161	76.580	2.466
66	1,279,264	-	-	2	15	17	80	-	-	2,100	1,207	3,307	13.289	2.585
67	264,167	-	-	1	15	16	26	-	-	300	391	691	60.568	2.616
68	399,860	-	-	-	19	19	57	-	-	-	1,077	1,077	47.517	2.693
69	230,426	-	-	1	19	20	30	-	-	75	565	640	86.796	2.777
70	45,487	-	-	-	9	9	14	-	-	-	128	128	197.859	2.814

TABLE 4B. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1946 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
71	193,571	-	-	1	12	13	22	-	-	300	258	558	67.159	2.883
72	130,424	-	-	-	13	13	30	-	-	-	388	388	99.675	2.975
73	260,043	-	-	-	16	16	48	-	-	-	775	775	61.528	2.980
74	756,040	-	-	-	41	41	56	-	-	-	2,293	2,293	54.230	3.033
75	648,685	-	-	4	6	10	42	-	-	1,725	249	1,974	15.416	3.043
76	60,195	-	-	-	13	13	14	-	-	-	186	186	215.965	3.090
77	141,000	-	-	-	12	12	36	-	-	-	436	436	85.106	3.092
78	275,609	-	-	-	26	26	34	-	-	-	873	873	94.337	3.168
79	78,353	-	-	-	5	5	50	-	-	-	251	251	63.814	3.203
80	94,846	-	-	-	5	5	61	-	-	-	305	305	52.717	3.216
81	286,632	-	-	3	14	17	24	-	-	600	334	934	59.309	3.259
82	463,528	-	-	-	28	28	55	-	-	-	1,526	1,526	60.406	3.292
83	1,239,192	-	-	5	23	28	77	-	-	2,625	1,763	4,388	22.595	3.541
84	206,323	-	-	1	18	19	23	-	-	375	421	796	92.089	3.858
85	464,779	-	-	3	17	20	18	-	-	1,500	300	1,800	43.031	3.873
86	912,888	-	-	3	44	47	57	-	-	1,050	2,498	3,548	51.485	3.887
87	36,341	-	-	-	3	3	51	-	-	-	152	152	82.551	4.183
88	1,154,167	-	-	3	25	28	58	-	-	3,450	1,458	4,908	24.260	4.252
89	87,788	-	-	-	18	18	22	-	-	-	392	392	205.039	4.465
90	202,893	-	-	-	22	22	42	-	-	-	919	919	108.432	4.529
91	2,288,412	1	-	1	73	75	58	6,000	-	300	4,262	10,562	32.774	4.615
92	485,002	-	-	2	18	20	35	-	-	1,740	637	2,377	41.237	4.901
93	47,517	-	-	-	3	3	80	-	-	-	241	241	63.135	5.072
94	1,614,172	1	-	3	45	49	22	6,000	-	2,235	991	9,226	30.356	5.716
95	451,940	-	-	2	15	17	41	-	-	1,966	622	2,588	37.616	5.726
96	393,841	-	-	2	50	52	24	-	-	1,350	1,183	2,533	132.033	6.432
97	1,319,013	1	-	1	47	49	51	6,000	-	150	2,415	8,565	37.149	6.493
98	1,077,902	1	-	1	29	31	31	6,000	-	300	893	7,193	28.760	6.673
99	110,075	-	-	-	12	12	62	-	-	-	738	738	109.017	6.705
100	994,073	1	-	1	9	11	87	6,000	-	150	786	6,936	11.066	6.977
101	974,044	1	-	-	13	14	74	6,000	-	-	966	6,966	14.373	7.152
102	980,886	1	-	2	25	28	34	6,000	-	375	848	7,223	28.546	7.364
103	270,983	-	-	1	4	5	18	-	-	2,000	72	2,072	18.451	7.646
104	976,707	1	-	1	15	17	77	6,000	-	525	1,152	7,677	17.405	7.860
105	445,256	-	-	2	18	20	48	-	-	2,700	864	3,564	44.918	8.004
106	41,380	-	-	-	7	7	50	-	-	-	352	352	169.164	8.507
107	856,318	1	-	-	24	25	61	6,000	-	-	1,459	7,459	29.195	8.711
108	891,819	1	-	2	42	45	30	6,000	-	525	1,258	7,783	50.459	8.727
109	41,787	-	-	-	2	2	183	-	-	-	366	366	47.862	8.759
110	836,287	1	-	1	38	40	43	6,000	-	300	1,628	7,928	47.830	9.480
111	766,913	1	-	-	45	46	30	6,000	-	-	1,343	7,343	59.981	9.575
112	449,200	-	-	1	4	5	46	-	-	4,500	183	4,683	11.131	10.425
113	161,981	-	-	1	5	6	3	-	-	1,800	14	1,814	37.041	11.199
114	591,756	1	-	1	28	30	15	6,000	-	300	427	6,727	50.697	11.368
115	694,754	1	-	3	42	46	33	6,000	-	1,040	1,370	8,410	66.210	12.105
116	1,203,062	2	-	1	120	123	22	12,000	-	300	2,583	14,883	102.239	12.371
117	533,412	1	-	1	25	27	38	6,000	-	150	957	7,107	50.618	13.324
118	974,207	1	1	-	112	114	18	6,000	6,000	-	2,067	14,067	117.018	14.439
119	452,621	1	-	-	22	23	27	6,000	-	-	598	6,598	50.815	14.577
120	109,849	-	-	1	19	20	21	-	-	1,200	406	1,606	182.068	14.620
121	690,613	1	-	3	19	23	42	6,000	-	3,450	798	10,248	33.304	14.839
122	1,467,631	2	-	4	65	71	39	12,000	-	7,350	2,550	21,900	48.377	14.922
123	529,464	-	-	3	5	8	58	-	-	7,800	291	8,091	15.110	15.281
124	416,476	1	-	-	8	9	53	6,000	-	-	426	6,426	21.610	15.429
125	778,903	2	-	-	30	32	28	12,000	-	-	840	12,840	41.083	16.485
126	765,916	2	-	-	19	21	44	12,000	-	-	840	12,840	27.418	16.764
127	374,785	1	-	-	16	17	28	6,000	-	-	441	6,441	45.359	17.186
128	558,282	1	-	1	16	18	43	6,000	-	3,000	695	9,695	32.242	17.366
129	1,342,310	2	1	4	68	75	30	12,000	6,000	4,530	2,026	24,556	55.874	18.294
130	327,179	1	-	-	1	2	49	6,000	-	-	49	6,049	6.113	18.488
131	784,435	2	-	1	39	42	66	12,000	-	150	2,578	14,728	53.542	18.775
132	653,522	1	1	-	18	20	26	6,000	6,000	-	464	12,464	30.603	19.072
133	364,235	-	1	-	37	38	36	-	6,000	-	1,315	7,315	104.328	20.083
134	311,767	1	-	-	15	16	26	6,000	-	-	385	6,385	51.320	20.480
135	904,859	1	2	-	45	48	46	6,000	12,000	-	2,085	20,085	53.047	22.197
136	678,410	2	-	2	58	62	43	12,000	-	990	2,480	15,470	91.390	22.803
137	345,984	1	-	1	7	9	73	6,000	-	1,500	509	8,009	26.013	23.148
138	479,478	1	-	3	28	32	22	6,000	-	5,232	605	11,837	66.739	24.687
139	15,432	-	-	1	1	2	84	-	-	300	84	384	129.601	24.883
140	587,448	1	-	3	84	88	37	6,000	-	5,550	3,072	14,622	149.800	24.891

TABLE 4B. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1946 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
141	584,087	1	1	5	21	28	14	6,000	6,000	2,250	301	14,551	47.938	24.912
142	254,160	1	-	-	15	16	27	6,000	-	-	398	6,398	62.952	25.173
143	264,085	1	-	-	17	18	53	6,000	-	-	899	6,899	68.160	26.124
144	250,480	1	-	-	42	43	25	6,000	-	-	1,046	7,046	171.670	28.130
145	874,951	4	-	1	42	47	32	24,000	-	1,200	1,327	26,527	53.717	30.318
146	437,093	2	-	2	6	10	110	12,000	-	1,380	659	14,039	22.878	32.119
147	168,339	-	1	1	11	13	35	-	6,000	150	385	6,535	77.225	38.820
148	158,301	1	-	-	9	10	17	6,000	-	-	149	6,149	63.171	38.844
149	136,317	1	-	-	5	6	19	6,000	-	-	95	6,095	44.015	44.712
150	143,002	-	1	-	8	9	50	-	6,000	-	396	6,396	62.936	44.727
151	569,276	2	1	5	61	69	23	12,000	6,000	11,550	1,407	30,957	121.207	54.380
152	299,612	2	-	1	20	23	46	12,000	-	4,500	924	17,424	76.766	58.155
153	101,640	1	-	-	5	6	16	6,000	-	-	78	6,078	59.032	59.799
154	188,925	2	-	-	6	8	17	12,000	-	-	99	12,099	42.345	64.041
155	88,560	1	-	-	2	3	19	6,000	-	-	38	6,038	33.875	68.180
156	201,008	3	-	-	33	36	33	18,000	-	-	1,081	19,081	179.097	94.927
157	126,467	2	-	-	5	7	41	12,000	-	-	203	12,203	55.350	96.492
158	57,349	1	-	-	4	5	28	6,000	-	-	110	6,110	87.185	106.541
159	34,027	1	-	-	6	7	65	6,000	-	-	387	6,387	205.719	187.704
160	14,832	1	-	-	3	4	11	6,000	-	-	32	6,032	269.687	406.682
Totals and averages 1946	67,358,832	70	10	108	2,849	3,037	37	420,000	60,000	101,138	104,626	685,764	45.087	10.181
1945	57,153,351	77	3	128	2,388	2,596	37	462,000	18,000	127,771	87,567	695,338	45.422	12.166

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permant total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

TABLE 4C. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1945 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	10,584	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000 4/
2	289,924	-	-	-	1	1	54	-	-	-	54	54	3.449	.186
3	132,651	-	-	-	1	1	25	-	-	-	25	25	7.539	.188
4	37,665	-	-	-	1	1	14	-	-	-	14	14	26.550	.372
5	291,980	-	-	-	2	2	58	-	-	-	116	116	6.850	.397
6	227,628	-	-	-	9	9	10	-	-	-	94	94	39.538	.413
7	95,800	-	-	-	4	4	11	-	-	-	45	45	41.754	.470
8	158,193	-	-	-	3	3	29	-	-	-	88	88	18.964	.556
9	944,703	-	-	-	8	8	75	-	-	-	597	597	8.468	.632
10	699,164	-	-	-	8	8	68	-	-	-	545	545	11.442	.780
11	102,840	-	-	-	3	3	27	-	-	-	82	82	29.172	.797
12	271,636	-	-	-	13	13	17	-	-	-	222	222	47.858	.817
13	43,656	-	-	-	7	7	6	-	-	-	39	39	160.345	.893
14	72,400	-	-	-	8	8	8	-	-	-	67	67	110.497	.925
15	47,462	-	-	-	5	5	9	-	-	-	46	46	105.347	.969
16	65,841	-	-	-	6	6	11	-	-	-	65	65	91.129	.987
17	372,328	-	-	-	13	13	30	-	-	-	395	395	34.915	1.061
18	153,213	-	-	-	1	1	172	-	-	-	172	172	6.527	1.123
19	145,629	-	-	-	7	7	24	-	-	-	170	170	48.067	1.167
20	266,971	-	-	-	33	33	10	-	-	-	320	320	123.609	1.199
21	271,644	-	-	-	11	11	31	-	-	-	346	346	40.494	1.274
22	214,688	-	-	-	4	4	69	-	-	-	277	277	18.632	1.290
23	783,429	-	-	-	21	21	51	-	-	-	1,072	1,072	26.805	1.368
24	137,516	-	-	-	4	4	47	-	-	-	189	189	29.088	1.374
25	693,883	-	-	1	5	6	42	-	-	900	211	1,111	8.647	1.601
26	470,560	-	-	-	21	21	36	-	-	-	763	763	44.628	1.621
27	66,067	-	-	-	3	3	36	-	-	-	109	109	45.408	1.650
28	950,494	-	-	2	31	33	32	-	-	600	977	1,577	34.719	1.659
29	362,504	-	-	-	17	17	35	-	-	-	603	603	46.896	1.663
30	278,981	-	-	1	4	5	41	-	-	300	165	465	17.922	1.667
31	649,539	-	-	1	26	27	31	-	-	300	807	1,107	41.568	1.704
32	301,327	-	-	-	20	20	27	-	-	-	531	531	66.373	1.762
33	336,951	-	-	-	26	26	24	-	-	-	619	619	77.163	1.837
34	405,443	-	-	-	6	6	130	-	-	-	778	778	14.799	1.919
35	303,618	-	-	-	20	20	30	-	-	-	600	600	65.872	1.976
36	1,219,230	-	-	3	21	24	31	-	-	1,800	655	2,455	19.685	2.014
37	112,453	-	-	-	4	4	57	-	-	-	228	228	35.570	2.028
38	46,078	-	-	-	3	3	32	-	-	-	96	96	65.107	2.083
39	86,012	-	-	-	5	5	37	-	-	-	184	184	58.131	2.139
40	964,533	-	-	1	8	9	106	-	-	1,320	846	2,166	9.331	2.246
41	384,591	-	-	1	16	17	36	-	-	300	575	875	44.203	2.275
42	429,132	-	-	-	48	48	22	-	-	-	1,042	1,042	111.854	2.428
43	253,172	-	-	-	13	13	48	-	-	-	623	623	51.348	2.461
44	417,530	-	-	1	14	15	54	-	-	300	759	1,059	35.926	2.536
45	44,082	-	-	-	2	2	58	-	-	-	116	116	45.370	2.631
46	151,938	-	-	-	10	10	41	-	-	-	413	413	65.816	2.718
47	221,104	-	-	-	11	11	59	-	-	-	648	648	49.750	2.931
48	450,081	-	-	1	24	25	18	-	-	750	429	1,179	55.546	2.620
49	840,659	-	-	2	5	7	100	-	-	2,100	500	2,600	8.327	3.093
50	354,473	-	-	1	30	31	22	-	-	480	651	1,131	87.454	3.191
51	48,617	-	-	-	5	5	31	-	-	-	157	157	102.845	3.229
52	519,899	-	-	1	31	32	45	-	-	300	1,390	1,690	61.550	3.251
53	48,466	-	-	-	10	10	16	-	-	-	162	162	206.330	3.343
54	280,200	-	-	1	19	20	35	-	-	300	668	968	71.378	3.455
55	140,526	-	-	-	14	14	38	-	-	-	530	530	99.626	3.772
56	252,612	-	-	-	30	30	35	-	-	-	1,054	1,054	118.759	4.172
57	15,652	-	-	-	1	1	68	-	-	-	68	68	63.890	4.344
58	207,176	-	-	-	27	27	34	-	-	-	909	909	130.324	4.388
59	345,790	-	-	2	18	20	34	-	-	1,050	618	1,668	57.839	4.824
60	630,000	-	-	3	16	19	69	-	-	2,100	1,108	3,208	30.159	5.092
61	771,627	-	-	3	13	16	57	-	-	3,600	742	4,342	20.735	5.627
62	265,347	-	-	1	23	24	41	-	-	600	937	1,537	90.448	5.792
63	264,474	-	-	1	9	10	50	-	-	1,200	452	1,652	37.811	6.246
64	1,013,374	-	-	2	101	103	30	-	-	3,300	3,034	6,334	101.641	6.250
65	107,429	-	-	-	8	8	85	-	-	-	678	678	74.468	6.311
66	63,353	-	-	-	8	8	52	-	-	-	418	418	126.277	6.598
67	100,860	-	-	1	5	6	15	-	-	600	75	675	59.488	6.692
68	544,609	-	-	1	4	5	29	-	-	3,600	118	3,718	9.181	6.827
69	95,452	-	-	-	15	15	44	-	-	-	656	656	157.147	6.873
70	1,106,492	1	-	1	31	33	59	6,000	-	300	1,830	8,130	29.824	7.348
71	1,176,677	1	-	1	9	11	43	6,000	-	3,000	386	9,386	9.348	7.977

TABLE 4C. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1945 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
72	1,452,610	1	-	1	48	50	55	6,000	-	3,000	2,635	11,635	34.421	8.010
73	229,377	-	-	1	8	9	15	-	-	1,800	118	1,918	39.237	8.362
74	604,628	-	-	8	8	16	79	-	-	4,558	634	5,192	26.463	8.587
75	1,537,658	1	-	5	176	182	12	6,000	-	5,100	2,176	13,276	118.362	8.634
76	984,768	1	-	3	-	4	-	6,000	-	2,665	-	8,665	4.062	8.799
77	888,135	1	-	1	34	36	50	6,000	-	600	1,685	8,285	40.534	9.329
78	693,525	1	-	-	37	38	19	6,000	-	-	686	6,686	54.793	9.641
79	1,479,237	2	-	2	65	69	35	12,000	-	1,050	2,276	15,326	46.646	10.361
80	1,159,169	1	-	1	48	50	38	6,000	-	4,500	1,824	12,324	43.134	10.632
81	152,767	-	-	1	8	9	58	-	-	1,200	462	1,662	58.913	10.879
82	1,112,798	2	-	-	11	13	68	12,000	-	-	749	12,749	11.682	11.457
83	524,705	1	-	-	6	7	30	6,000	-	-	182	6,182	13.341	11.782
84	551,123	-	-	4	34	38	29	-	-	5,670	986	6,656	68.950	12.077
85	1,087,350	1	-	5	59	65	52	6,000	-	4,500	3,045	13,545	59.778	12.457
86	513,577	1	-	2	10	13	22	6,000	-	420	219	6,639	25.313	12.927
87	984,790	2	-	-	71	73	14	12,000	-	-	978	12,978	74.128	13.178
88	442,633	1	-	-	9	10	21	6,000	-	-	191	6,191	22.592	13.987
89	492,566	1	-	1	20	22	37	6,000	-	300	736	7,036	44.664	14.284
90	462,589	-	1	1	21	23	29	-	6,000	300	617	6,917	49.720	14.953
91	1,576,947	3	-	4	68	75	50	18,000	-	2,250	3,415	23,665	47.560	15.007
92	364,940	-	-	4	35	39	25	-	-	4,650	883	5,533	106.867	15.161
93	603,594	1	-	3	6	10	115	6,000	-	2,940	687	9,627	16.567	15.949
94	432,158	1	-	-	38	39	29	6,000	-	-	1,089	7,089	90.245	16.404
95	421,568	1	-	1	14	16	47	6,000	-	300	651	6,951	37.954	16.488
96	453,272	1	-	2	15	18	22	6,000	-	1,800	333	8,133	39.711	17.943
97	241,974	-	-	2	12	14	70	-	-	3,750	844	4,594	57.857	18.986
98	855,709	2	-	4	40	46	37	12,000	-	3,300	1,472	16,772	53.757	19.600
99	630,951	1	1	-	3	5	213	6,000	6,000	-	638	12,638	7.925	20.030
100	774,124	2	-	-	61	63	61	12,000	-	-	3,707	15,707	81.382	20.290
101	495,543	-	-	2	23	25	59	-	-	9,000	1,362	10,362	50.450	20.910
102	335,701	1	-	1	17	19	62	6,000	-	300	1,056	7,356	56.598	21.912
103	1,910,582	6	-	8	12	26	51	36,000	-	6,533	613	43,146	13.608	22.583
104	330,976	1	-	2	21	24	34	6,000	-	900	705	7,605	72.513	22.977
105	657,796	2	-	1	14	17	42	12,000	-	3,000	589	15,589	25.844	23.699
106	260,062	1	-	1	10	12	23	6,000	-	300	231	6,531	46.143	25.113
107	225,446	1	-	-	3	4	10	6,000	-	-	31	6,031	17.743	26.751
108	646,449	1	-	7	66	74	21	6,000	-	11,085	1,405	18,490	114.472	28.602
109	465,587	2	-	2	28	32	16	12,000	-	900	441	13,341	68.730	28.654
110	651,790	3	-	1	26	30	46	18,000	-	1,200	1,183	20,383	46.027	31.272
111	456,297	2	-	2	17	21	85	12,000	-	1,050	1,445	14,495	46.023	31.767
112	232,526	1	-	-	27	28	54	6,000	-	-	1,452	7,452	120.417	32.048
113	813,786	4	-	2	4	10	96	24,000	-	1,800	385	26,185	12.288	32.177
114	442,660	2	-	1	18	21	39	12,000	-	1,800	699	14,499	47.440	32.754
115	196,200	1	-	2	15	18	11	6,000	-	900	160	7,060	91.743	35.984
116	168,498	-	1	-	31	32	14	-	6,000	-	421	6,421	189.913	38.107
117	158,717	1	-	-	6	7	23	6,000	-	-	136	6,136	44.104	38.660
118	477,556	3	-	1	23	27	61	18,000	-	300	1,398	19,698	56.538	41.248
119	161,599	1	-	1	8	10	43	6,000	-	750	344	7,094	61.882	43.899
120	1,031,632	7	-	3	26	36	90	42,000	-	3,600	2,352	47,952	34.896	46.482
121	1,048,974	8	-	3	60	71	32	48,000	-	3,300	1,914	53,214	67.685	50.730
122	694,094	6	-	2	65	73	35	36,000	-	600	2,283	38,883	105.173	56.020
Totals and averages 1945 5/	57,153,351	77	3	128	2,388	2,596	37	462,000	18,000	127,771	87,567	695,338	45.422	12.166
Totals and averages 1945 6/	58,202,325	85	3	131	2,448	2,667	37	510,000	18,000	131,071	89,481	748,552	45.823	12.861
Totals and averages 1944	49,461,856	57	3	95	1,859	2,014	37	342,000	18,000	86,546	69,697	516,243	40.718	10.437

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F. fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

4/ Mine is not eligible for trophy because of failure to meet contest rule requiring at least 25 men employed underground for not less than 100 days and 30,000 man-hours or more of employment.

5/ Omitting the entire record of 1 mine in which 7 lives were lost.

6/ Including the record of the mine referred to in footnote 5.

TABLE 4D. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1944 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	81,650	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	69,190	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	582,017	-	-	-	1	1	23	-	-	-	23	23	1.718	.040
4	940,923	-	-	-	3	3	53	-	-	-	159	159	3.188	.169
5	158,240	-	-	-	4	4	10	-	-	-	41	41	25.278	.259
6	50,539	-	-	-	1	1	17	-	-	-	17	17	19.787	.336
7	328,607	-	-	-	8	8	26	-	-	-	208	208	24.345	.633
8	653,421	-	-	-	5	5	85	-	-	-	424	424	7.652	.649
9	45,673	-	-	-	3	3	10	-	-	-	31	31	65.684	.679
10	17,787	-	-	-	2	2	8	-	-	-	15	15	112.442	.843
11	1,160,477	-	-	2	5	7	106	-	-	600	529	1,129	6.032	.973
12	46,744	-	-	-	5	5	10	-	-	-	50	50	106.966	1.070
13	402,253	-	-	1	12	13	15	-	-	300	177	477	32.318	1.186
14	583,428	-	-	-	26	26	29	-	-	-	752	752	44.564	1.289
15	1,206,446	-	-	1	37	38	34	-	-	360	1,243	1,603	31.497	1.329
16	338,172	1	-	2	17	20	36	6,000	-	600	617	7,217	59.142	1.341
17	321,502	-	-	-	6	6	80	-	-	-	480	480	18.662	1.493
18	548,051	-	-	1	10	11	26	-	-	600	262	862	20.071	1.573
19	457,016	-	-	-	11	11	68	-	-	-	748	748	24.069	1.637
20	129,238	-	-	-	12	12	18	-	-	-	220	220	92.852	1.702
21	364,325	-	-	-	22	22	30	-	-	-	653	653	60.386	1.792
22	446,170	-	-	1	10	11	51	-	-	300	510	810	24.654	1.815
23	323,915	-	-	-	12	12	49	-	-	-	590	590	37.047	1.821
24	492,697	-	-	-	37	37	26	-	-	-	974	974	75.097	1.977
25	308,731	-	-	-	20	20	32	-	-	-	632	632	64.781	2.047
26	727,609	-	-	2	25	27	34	-	-	900	853	1,753	37.108	2.409
27	1,003,180	-	-	2	65	67	30	-	-	600	1,964	2,564	66.788	2.556
28	611,191	-	-	2	43	45	22	-	-	600	964	1,564	73.627	2.559
29	286,018	-	-	1	4	5	114	-	-	300	457	757	17.481	2.647
30	333,555	-	-	-	18	18	57	-	-	-	1,027	1,027	53.964	3.079
31	643,299	-	-	3	8	11	39	-	-	1,680	313	1,993	17.099	3.098
32	919,864	-	-	2	79	81	25	-	-	900	1,971	2,871	88.057	3.121
33	649,699	-	-	1	52	53	35	-	-	300	1,830	2,130	81.576	3.278
34	312,845	-	-	1	24	25	13	-	-	750	310	1,060	79.912	3.388
35	59,117	-	-	-	7	7	29	-	-	-	204	204	118.409	3.451
36	496,087	-	-	1	5	6	88	-	-	1,800	439	2,239	12.095	4.513
37	1,121,329	-	-	2	59	61	48	-	-	2,700	2,836	5,536	54.400	4.937
38	1,434,613	1	-	1	26	28	37	6,000	-	300	964	7,264	19.517	5.063
39	122,928	-	-	-	4	4	168	-	-	-	673	673	32.539	5.475
40	174,063	-	-	2	8	10	14	-	-	900	113	1,013	57.450	5.820
41	1,298,501	1	-	1	10	12	149	6,000	-	300	1,492	7,792	9.241	6.001
42	95,613	-	-	-	21	21	27	-	-	-	574	574	219.635	6.003
43	1,091,746	1	-	-	18	19	47	6,000	-	-	852	6,852	17.403	6.276
44	1,731,754	1	-	5	18	24	67	6,000	-	3,920	1,202	11,122	13.859	6.422
45	43,840	-	-	-	5	5	57	-	-	-	285	285	114.051	6.501
46	524,010	-	-	3	17	20	37	-	-	3,480	624	4,104	38.167	7.832
47	1,733,004	2	-	1	63	66	30	12,000	-	1,200	1,880	15,080	38.084	8.702
48	755,551	1	-	-	47	48	27	6,000	-	-	1,255	7,255	63.530	9.602
49	654,080	1	-	-	5	6	94	6,000	-	-	469	6,469	9.173	9.890
50	804,866	1	-	1	4	6	87	6,000	-	1,656	348	8,004	7.455	9.945
51	819,290	1	-	2	25	28	52	6,000	-	900	1,306	8,206	34.176	10.016
52	682,550	1	-	1	21	23	38	6,000	-	300	796	7,096	33.697	10.396
53	974,987	1	-	2	71	74	47	6,000	-	1,350	3,314	10,664	75.898	10.938
54	1,488,143	2	-	2	44	48	34	12,000	-	3,600	1,517	17,117	32.255	11.502
55	1,209,468	2	-	2	76	80	28	12,000	-	600	2,095	14,695	66.145	12.150
56	601,208	1	-	1	15	17	29	6,000	-	1,200	440	7,640	28.276	12.708
57	1,025,997	2	-	1	12	15	93	12,000	-	300	1,110	13,410	14.619	13.070
58	723,260	1	-	4	23	28	34	6,000	-	3,300	779	10,079	38.714	13.936
59	632,253	-	1	2	37	40	31	-	6,000	2,100	1,152	9,252	63.266	14.633
60	412,906	1	-	-	1	2	90	6,000	-	-	90	6,090	4.844	14.749
61	203,285	-	-	1	1	2	15	-	-	3,000	15	3,015	9.838	14.831
62	465,798	1	-	1	9	11	36	6,000	-	900	326	7,226	23.615	15.513
63	295,402	-	-	2	2	4	14	-	-	4,800	27	4,827	13.541	16.340
64	815,564	1	-	3	9	13	123	6,000	-	6,300	1,107	13,407	15.940	16.439
65	953,717	2	-	3	30	35	52	12,000	-	2,400	1,570	15,970	36.699	16.745
66	742,952	2	-	1	11	14	37	12,000	-	300	412	12,712	18.844	17.110
67	1,623,512	4	-	-	58	62	65	24,000	-	-	3,793	27,793	38.189	17.119
68	395,281	-	1	-	15	16	51	-	6,000	-	767	6,767	40.478	17.119
69	837,779	2	-	5	11	18	86	12,000	-	2,850	942	15,792	21.485	18.850
70	345,149	1	-	-	40	41	17	6,000	-	-	691	6,691	118.789	19.386

TABLE 4D. - Injury experience of each BITUMINOUS-COAL mine enrolled in the National Safety Competition of 1944 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
71	289,879	1	-	-	6	7	18	6,000	-	-	106	6,106	24.148	21.064
72	340,352	-	-	5	16	21	28	-	-	7,200	450	7,650	61.701	22.477
73	1,536,185	5	-	2	155	162	26	30,000	-	1,050	4,029	35,079	105.456	22.835
74	266,145	1	-	-	26	27	16	6,000	-	-	415	6,415	101.448	24.103
75	531,983	1	-	5	21	27	36	6,000	-	6,250	749	12.999	50.754	24.435
76	555,906	2	-	1	6	9	107	12,000	-	1,200	641	13,841	16.190	24.898
77	542,155	1	1	1	58	61	36	6,000	6,000	300	2,083	14,383	112.514	26.529
78	255,411	1	-	-	40	41	29	6,000	-	-	1,148	7,148	160.526	27.986
79	240,870	1	-	2	25	28	11	6,000	-	600	285	6,885	116.245	28.584
80	415,632	2	-	-	19	21	27	12,000	-	-	521	12,521	50.525	30.125
81	793,513	3	-	3	9	15	121	18,000	-	7,250	1,085	26,335	18.903	33.188
82	591,712	3	-	3	52	58	44	18,000	-	3,150	2,289	23,439	98.021	39.612
83	168,037	1	-	1	11	13	36	6,000	-	300	393	6,693	77.364	39.831
Totals and averages 1944	49,461,856	57	3	95	1,859	2,014	37	342,000	18,000	86,546	69,697	516,243	40.718	10.437
1943	48,489,430	45	2	130	1,920	2,097	35	270,000	12,000	115,774	67,853	465,627	43.239	9.601

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F. fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

METAL GROUP

Summary

All winners of "Sentinels of Safety" trophies and most of the winners of Certificates of Achievement in Safety during the past 4 years in the metal group have operated without a lost-time accident in the year in which they won awards. A newcomer to the National Safety Competition, the Soudan mine of the Oliver Iron Mining Co., at Soudan, St. Louis County, Minn., won top honors in the metal group in 1947.

The group record of the past 3 years is, in general, unfavorable. In 1946 the severity rate of 9.366 was the highest since 1928, and the frequency rate of 41.022 was the highest since 1929. However, in 1947 the severity rate was reduced to 6.963, and the frequency rate fell to 38.867. The record of 1944 is noteworthy in that the severity rate of 5.895 was the lowest since 1934. It is notable, also, that the number of participating mines has decreased gradually in recent years, from 56 in 1942 to 40 in 1947.

Table 5 summarizes the injury experience of the metal group in the 23 years of the National Safety Competition. Tables 6A, 6B, 6C, and 6D record the injury experience of each metal mine, in order of rank in the contest, enrolled in the National Safety Competitions of 1947, 1946, 1945, and 1944, respectively. Mines in the metal group that won "Sentinels of Safety" trophies and Certificates of Achievement in Safety in the competitions of the past 4 years are listed below.

Awards in the Competitions, 1947-44

The winners of "Sentinels of Safety" trophies in the metal group were as follows:

1947

Soudan iron-ore mine, Soudan, St. Louis County, Minn., operated by Oliver Iron Mining Co., 527,595 man-hours without a lost-time injury.

1946

Burra Burra copper mine, Ducktown, Polk County, Tenn., operated by Tennessee Copper Co., 130,902 man-hours without a lost-time injury.

1945

James iron-ore mine, Iron River, Iron County, Mich., operated by Pickands Mather & Co. (James Mining Co.), 177,373 man-hours without a lost-time injury.

1944

Newport iron-ore mine, Ironwood, Gogebic County, Mich., operated by Pickands Mather & Co. (Youngstown Mines Corp.), 599,262 man-hours without a lost-time injury.

The winners of Certificates of Achievement in Safety in the metal group were as follows:

1947

Althletic zinc sulfide mine, Jefferson City, Jefferson County, Tenn., operated by the American Zinc Co., of Tenn., 54,450 man-hours without a lost-time injury.

James iron-ore mine, Iron River, Iron County, Mich., operated by Pickands Mather & Co. (James Mining Co.), 224,077 man-hours with 1 lost-time injury that caused 6 days of disability. The injury-severity rate was 0.027.

Tobin iron-ore mine, Crystal Falls, Iron County, Mich., operated by Republic Steel Corp., 414,339 man-hours with 3 lost-time injuries that caused 12 days of disability. The injury-severity rate was 0.029.

Homer iron-ore mine, Iron River, Iron County, Mich., operated by The M. A. Hanna Co. (Hanna Iron Ore Co.), 464,114 man-hours with 5 lost-time injuries that caused 76 days of disability. The injury-severity rate was 0.164.

1946

Spruce iron-ore mine, Eveleth, St. Louis County, Minn., operated by Oliver Iron Mining Co., 97,737 man-hours without a lost-time injury.

Calloway-Mary copper mine, Ducktown, Polk County, Tenn., operated by Tennessee Copper Co., 73,562 man-hours without a lost-time injury.

Leonidas iron-ore mine, Eveleth, St. Louis County, Minn., operated by Oliver Iron Mining Co., 57,395 man-hours without a lost-time injury.

Davidson No. 3 iron-ore mine, Iron River, Iron County, Mich., operated by Pittsburgh Coke & Chemical Co., 91,158 man-hours with 1 lost-time injury that caused 1 day of disability. The injury-severity rate was 0.011.

1945

Calloway-Mary copper mine, Ducktown, Polk County, Tenn., operated by Tennessee Copper Co., 66,274 man-hours without a lost-time injury.

Zimmerman iron-ore mine, Gaastra, Iron County, Mich., operated by The Verona Mining Co., 51,519 man-hours with 1 lost-time injury that caused 3 days of disability. The injury-severity rate was 0.058.

Midnight lead-silver mine, Aspen, Pitkin County, Colo., operated by the Midnight Mining Co., 35,635 man-hours with 1 lost-time injury that caused 3 days of disability. The injury-severity rate was 0.084.

Tobin iron-ore mine, Crystal Falls, Iron County, Mich., operated by Republic Steel Corp., 382,573 man-hours with 3 lost-time injuries that caused 45 days of disability. The injury-severity rate was 0.118.

1944

Humboldt copper mine, Morenci, Greenlee County, Ariz., operated by Phelps-Dodge Corp., 96,424 man-hours without a lost-time injury.

Heckler bauxite mine, Little Rock, Pulaski County, Ark., operated by American Cyanamid & Chemical Corp., 59,788 man-hours without a lost-time injury.

Wakefield iron-ore mine, Wakefield, Gogebic County, Mich., operated by The M. A. Hanna Co., 78,364 man-hours with 2 lost-time injuries that caused 6 days of disability. The injury-severity rate was 0.077.

Davidson No. 3 iron-ore mine, Iron River, Iron County, Mich., operated by Pittsburgh Coke & Iron Co., 154,006 man-hours with 7 lost-time injuries that caused 18 days of disability. The injury-severity rate was 0.117.

TABLE 5. - Injury experience of Metal-mining Group in the National Safety Competition, 1925-47, by years.

Year	Number of mines	Man-hours	Number of injuries 1/					Number of days of disability 1/					Fre-quency rate 2/	Sever-ity rate 2/
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925	34	14,612,607	15	-	9	1,950	1,974	90,000	-	9,000	27,575	126,575	135.089	8.662
1926	44	15,411,121	13	-	10	1,756	1,779	78,000	-	10,622	27,258	115,880	115.436	7.519
1927	42	15,711,782	14	-	21	969	1,004	84,000	-	26,970	20,917	131,887	63.901	8.394
1928	48	16,518,598	21	-	16	824	861	126,000	-	16,500	14,603	157,103	52.123	9.511
1929	54	18,116,618	9	1	31	904	945	54,000	6,000	29,627	18,885	108,512	52.162	5.990
1930	52	16,852,977	10	1	20	297	328	60,000	6,000	13,160	9,857	89,017	19.462	5.282
1931	42	12,525,604	11	2	21	382	416	66,000	12,000	19,952	12,881	110,833	33.212	8.849
1932	33	7,029,717	5	2	9	247	263	30,000	12,000	10,950	10,705	63,655	37.413	9.055
1933	32	6,843,570	8	-	4	259	271	48,000	-	1,200	8,342	57,542	39.599	8.408
1934	30	10,214,228	5	1	10	318	334	30,000	6,000	8,210	11,415	55,625	32.699	5.446
1935	24	8,999,184	8	1	8	231	248	48,000	6,000	5,070	8,056	67,126	27.558	7.459
1936	32	11,282,459	9	-	17	127	153	54,000	-	13,440	6,595	74,035	13.561	6.562
1937	34	16,771,970	14	-	28	306	348	84,000	-	13,350	14,817	112,167	20.749	6.688
1938	42	15,956,257	11	-	36	301	348	66,000	-	20,537	11,638	98,175	21.810	6.153
1939	36	19,006,225	14	1	31	271	317	84,000	6,000	29,280	9,379	128,659	16.679	6.769
1940	40	22,270,923	19	1	46	297	363	114,000	6,000	28,743	13,490	162,233	16.299	7.285
1941	55	29,811,365	29	2	55	677	763	174,000	12,000	40,658	23,712	250,370	25.594	8.398
1942	56	33,366,547	25	-	59	704	788	150,000	-	47,479	26,324	223,803	23.616	6.707
1943	53	33,297,302	24	-	47	735	806	144,000	-	40,820	24,070	208,890	24.206	6.273
1944	44	20,181,343	12	-	34	467	513	72,000	-	29,517	17,456	118,973	25.420	5.895
1945	47	18,016,758	15	1	24	525	565	90,000	6,000	17,543	18,839	132,382	31.360	7.348
1946	44	12,456,871	15	-	25	471	511	90,000	-	15,316	11,358	116,674	41.022	9.366
1947	40	15,926,267	14	-	25	580	619	84,000	-	14,310	12,590	110,900	38.867	6.963
Total	-	391,180,293	320	13	586	13,598	14,517	1,920,000	78,000	462,254	360,762	2,821,016	37.111	7.212

1/ **P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.**

2/ **Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days lost from injuries per thousand man-hours.**

TABLE 6A. - Injury experience of each METAL mine enrolled in the National Safety Competition of 1947 1/

Rank	Man-hours worked	Number of injuries					Average days of disability per temp. injury	Number of days of disability					Frequency rate	Severity rate
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	527,595	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	54,470	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	20,495	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	224,077	-	-	-	1	1	6	-	-	-	6	6	4.463	.027
5	414,339	-	-	-	3	3	4	-	-	-	12	12	7.240	.029
6	464,114	-	-	-	5	5	15	-	-	-	76	76	10.773	.164
7	89,736	-	-	-	2	2	9	-	-	-	18	18	22.288	.201
8	279,070	-	-	-	7	7	9	-	-	-	60	60	25.083	.215
9	682,811	-	-	1	-	1	-	-	-	150	-	150	1.465	.220
10	324,159	-	-	-	2	2	67	-	-	-	134	134	6.170	.413
11	178,305	-	-	-	5	5	16	-	-	-	80	80	28.042	.449
12	562,641	-	-	1	8	9	23	-	-	150	184	334	15.996	.594
13	187,180	-	-	-	1	1	115	-	-	-	115	115	5.342	.614
14	512,930	-	-	-	11	11	30	-	-	-	329	329	21.445	.641
15	302,215	-	-	1	2	3	36	-	-	150	71	221	9.927	.731
16	659,488	-	-	-	38	38	15	-	-	-	580	580	57.620	.879
17	140,658	-	-	-	4	4	33	-	-	-	131	131	28.438	.931
18	107,204	-	-	-	7	7	18	-	-	-	125	125	65.296	1.166
19	94,281	-	-	-	1	1	.118	-	-	-	118	118	10.607	1.252
20	620,307	-	-	-	7	7	113	-	-	-	789	789	11.285	1.272
21	326,880	-	-	-	18	18	24	-	-	-	423	423	55.066	1.294
22	219,611	-	-	-	9	9	41	-	-	-	365	365	40.982	1.662
23	1,399,530	-	-	2	69	71	25	-	-	870	1,727	2,597	50.731	1.856
24	367,947	-	-	-	34	34	20	-	-	-	691	691	92.405	1.878
25	196,706	-	-	-	26	26	17	-	-	-	434	434	132.177	2.206
26	225,812	-	-	-	45	45	11	-	-	-	500	500	199.281	2.214
27	249,331	-	-	1	30	31	16	-	-	150	484	634	124.333	2.543
28	662,825	-	-	2	19	21	28	-	-	1,560	541	2,101	31.683	3.170
29	292,696	-	-	2	28	30	8	-	-	1,050	226	1,276	102.495	4.359
30	445,263	-	-	1	17	18	40	-	-	1,800	674	2,474	40.426	5.556
31	1,337,343	1	-	7	17	25	15	6,000	-	4,830	252	11,082	18.694	8.287
32	536,715	1	-	-	13	14	17	6,000	-	-	216	6,216	26.085	11.582
33	841,973	2	-	1	16	19	37	12,000	-	750	585	13,335	22.566	15.838
34	393,110	1	-	-	17	18	31	6,000	-	-	522	6,522	45.789	16.591
35	641,045	2	-	1	15	18	24	12,000	-	150	362	12,512	28.079	19.518
36	511,160	2	-	3	69	74	13	12,000	-	750	917	13,667	144.769	26.737
37	381,514	2	-	-	5	7	59	12,000	-	-	297	12,297	18.348	32.232
38	182,762	1	-	-	2	3	45	6,000	-	-	90	6,090	16.415	33.322
39	140,835	1	-	1	27	29	17	6,000	-	150	456	6,606	205.915	46.906
40	127,134	1	-	1	-	2	-	6,000	-	1,800	-	7,800	15.731	61.353
Total and averages 1947	15,926,267	14	-	25	580	619	22	84,000	-	14,310	12,590	110,900	38.867	6.963
1946	12,456,871	15	-	25	471	511	24	90,000	-	15,316	11,358	116,674	41.022	9.366

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total; P.P., permanent partial; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time accidents per million man-hours of exposure; severity rate indicates number of days lost from accidents per thousand man-hours.

TABLE 6B. - Injury experience of each METAL mine enrolled in the National Safety Competition of 1946 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	130,902	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	97,737	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	73,562	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	57,395	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	91,158	-	-	-	1	1	1	-	-	-	1	1	10.970	.011
6	553,194	-	-	-	1	1	17	-	-	-	17	17	1.808	.031
7	91,531	-	-	-	1	1	6	-	-	-	6	6	10.925	.066
8	175,682	-	-	-	2	2	10	-	-	-	19	19	11.384	.108
9	96,445	-	-	-	1	1	21	-	-	-	21	21	10.369	.218
10	162,671	-	-	-	2	2	24	-	-	-	48	48	12.295	.295
11	272,035	-	-	-	5	5	19	-	-	-	97	97	18.380	.357
12	121,933	-	-	-	3	3	28	-	-	-	83	83	24.604	.681
13	115,362	-	-	-	5	5	18	-	-	-	88	88	43.342	.763
14	183,508	-	-	-	5	5	33	-	-	-	165	165	27.247	.899
15	71,571	-	-	-	1	1	65	-	-	-	65	65	13.972	.908
16	587,842	-	-	-	14	14	46	-	-	-	648	648	23.816	1.102
17	208,792	-	-	-	11	11	22	-	-	-	239	239	52.684	1.145
18	289,550	-	-	1	3	4	19	-	-	285	56	341	13.815	1.178
19	59,473	-	-	-	3	3	24	-	-	-	73	73	50.443	1.227
20	138,910	-	-	-	3	3	59	-	-	-	176	176	21.597	1.267
21	408,301	-	-	1	7	8	37	-	-	300	257	557	19.593	1.364
22	482,712	-	-	1	4	5	24	-	-	600	95	695	10.358	1.440
23	40,075	-	-	-	2	2	31	-	-	-	61	61	49.906	1.522
24	40,523	-	-	-	1	1	63	-	-	-	63	63	24.677	1.555
25	546,260	-	-	-	35	35	25	-	-	-	890	890	64.072	1.629
26	333,394	-	-	-	13	13	42	-	-	-	574	574	38.993	1.722
27	258,110	-	-	-	6	6	78	-	-	-	467	467	23.246	1.809
28	1,119,375	-	-	2	75	77	15	-	-	1,200	1,145	2,345	68.788	2.095
29	224,977	-	-	-	37	37	14	-	-	-	520	520	164.461	2.311
30	242,869	-	-	1	9	10	38	-	-	525	341	866	41.174	3.566
31	666,887	-	-	4	8	12	39	-	-	4,275	312	4,587	17.994	6.878
32	640,192	1	-	2	4	7	15	6,000	-	75	59	6,134	10.934	9.582
33	537,431	1	-	-	11	12	44	6,000	-	-	485	6,485	22.328	12.067
34	481,990	1	-	-	6	7	15	6,000	-	-	90	6,090	14.523	12.635
35	444,226	1	-	-	6	7	51	6,000	-	-	306	6,306	15.758	14.195
36	427,605	1	-	2	12	15	24	6,000	-	300	290	6,590	35.079	15.411
37	448,150	1	-	3	63	67	13	6,000	-	2,050	789	8,839	149.504	19.723
38	312,998	1	-	-	9	10	23	6,000	-	-	210	6,210	31.949	19.840
39	384,077	1	-	3	10	14	55	6,000	-	2,006	547	8,553	36.451	22.269
40	290,478	1	-	2	33	36	27	6,000	-	300	883	7,183	123.934	24.728
41	204,395	2	-	2	24	28	18	12,000	-	400	431	12,831	136.990	62.776
42	134,275	1	-	1	19	21	24	6,000	-	3,000	454	9,454	156.395	70.408
43	153,781	2	-	-	12	14	19	12,000	-	-	225	12,225	91.039	79.496
44	54,537	1	-	-	4	5	16	6,000	-	-	62	6,062	91.681	111.154
Totals and averages 1946	12,456,871	15	-	25	471	511	24	90,000	-	15,316	11,358	116,674	41.022	9.366
1945	18,016,758	15	1	24	525	565	36	90,000	6,000	17,543	18,839	132,382	31.360	7.348

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time accidents per million man-hours of exposure; severity rate indicates number of days lost from accidents per thousand man-hours.

TABLE 6C. - Injury experience of each METAL mine enrolled in the National Safety Competition of 1945 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	177,373	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	66,274	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	51,519	-	-	-	1	1	3	-	-	-	3	3	19.410	.058
4	35,635	-	-	-	1	1	3	-	-	-	3	3	28.062	.084
5	382,573	-	-	-	3	3	15	-	-	-	45	45	7.842	.118
6	800,509	-	-	-	2	2	83	-	-	-	165	165	2.498	.206
7	676,265	-	-	-	7	7	25	-	-	-	175	175	10.351	.259
8	254,823	-	-	-	6	6	15	-	-	-	89	89	23.546	.349
9	107,123	-	-	-	1	1	51	-	-	-	51	51	9.335	.476
10	229,423	-	-	-	5	5	23	-	-	-	116	116	21.794	.506
11	633,014	-	-	-	7	7	74	-	-	-	516	516	11.058	.815
12	1,088,680	-	-	-	18	18	55	-	-	-	993	993	16.534	.912
13	167,533	-	-	-	7	7	23	-	-	-	163	163	41.783	.973
14	163,921	-	-	-	7	7	24	-	-	-	165	165	42.703	1.007
15	348,918	-	-	-	23	23	16	-	-	-	368	368	65.918	1.055
16	12,285	-	-	-	1	1	15	-	-	-	15	15	81.400	1.221
17	278,419	-	-	1	6	7	31	-	-	173	186	359	25.142	1.289
18	174,480	-	-	-	11	11	21	-	-	-	233	233	63.044	1.335
19	1,038,859	-	-	4	13	17	23	-	-	1,215	293	1,508	16.364	1.452
20	81,842	-	-	-	6	6	22	-	-	-	130	130	73.312	1.588
21	268,648	-	-	-	23	23	26	-	-	-	587	587	85.614	2.185
22	283,100	-	-	1	12	13	34	-	-	300	402	702	45.920	2.480
23	149,972	-	-	-	18	18	21	-	-	-	377	377	120.022	2.514
24	381,459	-	-	-	7	7	158	-	-	-	1,107	1,107	18.351	2.902
25	640,456	-	-	-	61	61	32	-	-	-	1,949	1,949	95.245	3.043
26	741,782	-	-	1	12	13	48	-	-	1,800	578	2,378	17.525	3.206
27	436,682	-	-	1	14	15	49	-	-	750	687	1,437	34.350	3.291
28	194,562	-	-	1	7	8	57	-	-	300	399	699	41.118	3.593
29	475,303	-	-	1	18	19	33	-	-	1,200	590	1,790	39.975	3.766
30	97,937	-	-	-	13	13	34	-	-	-	437	437	132.738	4.462
31	228,415	-	-	1	8	9	70	-	-	540	562	1,102	39.402	4.825
32	1,250,846	1	-	-	74	75	19	6,000	-	-	1,383	7,383	59.959	5.902
33	232,441	-	-	1	11	12	43	-	-	1,200	474	1,674	51.626	7.202
34	37,688	-	-	-	1	1	281	-	-	-	281	281	26.534	7.456
35	314,784	-	-	1	11	12	38	-	-	2,400	415	2,815	38.121	8.943
36	1,635,840	2	-	5	32	39	42	12,000	-	1,335	1,332	14,667	23.841	8.966
37	736,039	1	-	-	15	16	50	6,000	-	-	747	6,747	21.738	9.167
38	670,030	-	1	-	5	6	88	-	6,000	-	441	6,441	8.955	9.613
39	662,314	1	-	1	15	17	45	6,000	-	300	676	6,976	25.668	10.533
40	323,955	1	-	-	13	14	38	6,000	-	-	494	6,494	43.216	20.046
41	503,139	1	-	1	12	14	14	6,000	-	4,500	167	10,667	27.825	21.201
42	266,283	1	-	1	1	3	241	6,000	-	300	241	6,541	11.266	24.564
43	32,064	-	-	2	3	5	45	-	-	930	136	1,066	155.938	33.246
44	313,062	2	-	-	4	6	47	12,000	-	-	188	12,188	19.166	38.932
45	102,704	1	-	-	2	3	24	6,000	-	-	47	6,047	29.210	58.878
46	98,296	1	-	1	2	4	130	6,000	-	300	260	6,560	40.693	66.737
47	169,489	3	-	-	6	9	29	18,000	-	-	173	18,173	53.101	107.222
Totals and averages 1945	18,016,758	15	1	24	525	565	36	90,000	6,000	17,543	18,839	132,382	31.360	7.348
1944	20,181,343	12	-	34	467	513	37	72,000	-	29,517	17,456	118,973	25.420	5.895

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days lost from injuries per thousand man-hours.

TABLE 6D. - Injury experience of each METAL mine enrolled in the National Safety Competition of 1944 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	599,262	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	96,424	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	59,788	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	78,364	-	-	-	2	2	3	-	-	-	6	6	25.522	.077
5	154,006	-	-	-	7	7	3	-	-	-	18	18	45.453	.117
6	382,393	-	-	-	3	3	30	-	-	-	90	90	7.845	.235
7	113,806	-	-	-	2	2	14	-	-	-	27	27	17.574	.237
8	425,532	-	-	-	7	7	17	-	-	-	122	122	16.450	.287
9	1,195,134	-	-	-	17	17	38	-	-	-	643	643	14.224	.538
10	386,215	-	-	-	10	10	23	-	-	-	228	228	25.892	.590
11	462,463	-	-	-	2	2	158	-	-	-	316	316	4.325	.683
12	244,811	-	-	-	5	5	42	-	-	-	211	211	20.424	.862
13	84,833	-	-	-	3	3	25	-	-	-	75	75	35.364	.884
14	824,639	-	-	1	13	14	34	-	-	300	437	737	16.977	.894
15	42,356	-	-	-	1	1	42	-	-	-	42	42	23.609	.992
16	227,328	-	-	-	9	9	25	-	-	-	228	228	39.590	1.003
17	129,189	-	-	-	4	4	33	-	-	-	131	131	30.962	1.014
18	193,383	-	-	1	5	6	29	-	-	60	147	207	31.027	1.070
19	11,531	-	-	-	1	1	13	-	-	-	13	13	86.723	1.127
20	696,431	-	-	1	8	9	63	-	-	300	504	804	12.923	1.154
21	251,678	-	-	-	6	6	54	-	-	-	321	321	23.840	1.275
22	191,154	-	-	-	4	4	67	-	-	-	268	268	20.926	1.402
23	1,679,768	-	-	3	20	23	75	-	-	900	1,500	2,400	13.692	1.429
24	230,822	-	-	-	7	7	60	-	-	-	418	418	30.326	1.811
25	428,580	-	-	-	16	16	53	-	-	-	843	843	37.333	1.967
26	459,071	-	-	2	6	8	57	-	-	600	343	943	17.426	2.054
27	292,403	-	-	1	7	8	56	-	-	300	389	689	27.360	2.356
28	670,496	-	-	1	61	62	17	-	-	750	1,023	1,773	92.469	2.644
29	283,316	-	-	1	10	11	46	-	-	300	456	756	38.826	2.668
30	114,118	-	-	-	12	12	26	-	-	-	317	317	105.154	2.778
31	91,025	-	-	1	-	1	-	-	-	300	-	300	10.986	3.296
32	603,216	-	-	-	21	21	111	-	-	-	2,329	2,329	34.813	3.861
33	100,917	-	-	1	3	4	31	-	-	300	94	394	39.637	3.904
34	219,667	-	-	2	6	8	18	-	-	1,050	106	1,156	36.419	5.263
35	1,365,378	1	-	2	9	12	64	6,000	-	1,135	574	7,709	8.789	5.646
36	2,696,376	2	-	7	48	57	38	12,000	-	10,245	1,830	24,075	21.139	8.929
37	538,491	1	-	-	1	2	221	6,000	-	-	221	6,221	3.714	11.553
38	677,177	1	-	1	20	22	36	6,000	-	1,800	711	8,511	32.488	12.568
39	1,270,646	2	-	5	70	77	19	12,000	-	5,777	1,356	19,133	60.599	15.058
40	703,204	2	-	-	10	12	50	12,000	-	-	500	12,500	17.065	17.776
41	368,481	1	-	1	6	8	51	6,000	-	300	306	6,606	21.711	17.928
42	181,238	-	-	2	22	24	8	-	-	4,800	184	4,984	132.423	27.500
43	214,025	1	-	1	2	4	37	6,000	-	300	73	6,373	18.689	29.777
44	142,208	1	-	-	1	2	56	6,000	-	-	56	6,056	14.064	42.586
Totals and averages 1944	20,181,343	12	0	34	467	513	37	72,000	0	29,517	17,456	118,973	25.420	5.895
1943	33,297,302	24	0	47	735	806	33	144,000	0	40,820	24,070	208,890	24.206	6.273

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

NONMETAL GROUP

Summary

All winners of "Sentinels of Safety" trophies and Certificates of Achievement in Safety in the past 4 competitions operated without a lost-time injury. Therefore, mines that had the greatest number of man-hours of injury-free operation were selected as trophy winners. The No. 5 limestone mine of the Tennessee Coal, Iron & Railroad Co., at Bessemer, Jefferson County, Ala., had the best safety record in 1947, having been injury-free after operating 314,310 man-hours during the year. This mine has been cited frequently in the past for its accomplishments in injury prevention. It has won the "Sentinels of Safety" trophy in 4 previous years and a Certificate of Achievement in Safety on another occasion in recognition of its perfect safety records in those years.

When compared with previous years, the group record during the past 4 years is unfavorable. The injury-frequency rates are above the 23-year average for the group in each of the years except 1947, in which there was a significant drop to 28.425 from the rate of 34.702 of the previous year. The severity rate was well above average in every year except 1944. In fact, the injury-severity rate of 11.898 in 1947 was the highest for the group in its history in the National Safety Competition despite the fact that the frequency rate of the same year was the lowest in 5 years. The unusually high severity rate resulted primarily because of the fact that 8 fatalities, the greatest number in any contest year, occurred in the enrolled mines in 1947.

Table 7 summarizies the injury experience of the nonmetal group in the 23 years of the National Safety Competition. Tables 8A, 8B, 8C, and 8D record the injury experience of the mines, in order of rank in the contest, enrolled in the competitions of 1947, 1946, 1945, and 1944, respectively. Mines in the nonmetal group that won "Sentinels of Safety" trophies and Certificates of Achievement in Safety in the competitions of the past 4 years are listed below.

Awards in the Competitions, 1947-44

The winners of "Sentinels of Safety" trophies in the nonmetal group were as follows:

1947

No. 5 limestone mine, Bessemer, Jefferson County, Ala., operated by Tennessee Coal, Iron & Railroad Co., 314,310 man-hours without a lost-time injury.

1946

Acme gypsum mine, Acme, Hardeman County, Tex., operated by Certain-teed Products Corp., 292,000 man-hours without a lost-time injury.

1945

Freeport fire clay mine, Freeport, Armstrong County, Pa., operated by Freeport Brick Co., 71,760 man-hours without a lost-time injury.

1944

Akron gypsum mine, Akron, Genesee County, N. Y., operated by National Gypsum Co., 120,723 man-hours without a lost-time injury.

The winners of Certificates of Achievement in Safety in the nonmetal group having operated for the year without a lost-time injury, were as follows:

1947

Ironton cement-rock mine, Ironton, Lawrence County, Ohio, operated by Alpha Portland Cement Co., 168,878 man-hours.

Crystal City silica mine, Crystal City, Jefferson County, Mo., operated by Pittsburgh Plate Glass Co., 88,238 man-hours.

Hanover gypsum mine, Hanover, Fergus County, Mont., operated by Ideal Cement Co. (Three Forks Portland Cement Co.), 62,311 man-hours.

Crestmore limestone mine, Riverside, Riverside County, Calif., operated by Riverside Cement Co., 52,819 man-hours.

Carey salt mine, Hutchinson, Reno County, Kans., operated by Carey Salt Co., 31,144 man-hours.

1946

Akron gypsum mine, Akron, Genesee County, N. Y., operated by National Gypsum Co., 142,721 man-hours.

Ironton cement-rock mine, Ironton, Lawrence County, Ohio, operated by Alpha Portland Cement Co., 136,844 man-hours.

Wampum limestone mine, Wampum, Lawrence County, Pa., operated by Medusa Portland Cement Co., 89,184 man-hours.

Bakerton limestone mine, Bakerton, Jefferson County, W. Va., operated by Standard Lime & Stone Co., 81,319 man-hours.

Winnfield salt mine, Winnfield, Winn County, La., operated by The Carey Salt Co., 73,522 man-hours.

No. 3 shale mine, Hannibal, Ralls County, Mo., operated by Universal Atlas Cement Co., 52,160 man-hours.

Crestmore limestone mine, Riverside, Riverside County, Calif., operated by Riverside Cement Co., 48,353 man-hours.

1945

Akron gypsum mine, Akron, Genesee County, N. Y., operated by National Gypsum Co., 103,787 man-hours.

Sugar Creek limestone mine, Independence, Jackson County, Mo., operated by Missouri Portland Cement Co., 64,638 man-hours.

Clarence Center gypsum mine, Clarence Center, Erie County, N. Y., operated by National Gypsum Co., 56,436 man-hours.

Crestmore limestone mine, Riverside, Riverside County, Calif., operated by Riverside Cement Co., 37,376 man-hours.

Crystal City silica mine, Crystal City, Jefferson County, Mo., operated by Pittsburgh Plate Glass Co., 36,250 man-hours.

1944

Sugar Creek limestone mine, Independence, Jackson County, Mo., operated by Missouri Portland Cement Co., 77,428 man-hours.

Grand Rapids gypsum mine, Grand Rapids, Kent County, Mich., operated by Certain-teed Products Corp., 57,861 man-hours.

Riverside limestone mine, Riverside, Riverside County, Calif., operated by Riverside Cement Co., 55,432 man-hours.

Dunbar limestone mine, Dunbar, Fayette County, Pa., operated by New Castle Lime & Stone Co., 42,578 man-hours.

TABLE 7. - Injury experience of NONMETAL group in the National Safety Competition, 1925-47, by years.

Year	Number of mines	Man-hours	Number of injuries 1/					Number of days of disability 1/					Frequency rate 2/	Severity rate 2/
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925	14	3,407,054	3	-	4	268	275	18,000	-	3,150	4,913	26,063	80.715	7.650
1926	17	3,888,849	3	-	3	301	307	18,000	-	1,200	5,700	24,900	78.944	6.403
1927	14	2,696,288	1	-	3	86	90	6,000	-	3,600	2,299	11,899	33.379	4.413
1928	19	2,922,799	3	-	4	147	154	18,000	-	2,880	2,313	23,193	52.689	7.935
1929	19	3,897,004	4	-	5	112	121	24,000	-	3,950	2,424	30,374	31.049	7.794
1930	24	3,408,763	2	-	3	114	119	12,000	-	1,325	3,370	16,695	34.910	4.898
1931	22	2,390,580	3	-	2	35	40	18,000	-	1,100	1,078	20,178	16.732	8.441
1932	20	1,507,052	1	-	-	20	21	6,000	-	-	636	6,636	13.934	4.403
1933	18	1,410,438	-	-	1	32	33	-	-	300	1,066	1,366	23.397	.968
1934	20	1,935,930	3	-	1	42	46	18,000	-	270	1,128	19,398	23.761	10.020
1935	20	1,984,540	-	-	-	23	23	-	-	-	1,145	1,145	11.590	.577
1936	21	2,866,679	2	-	2	32	36	12,000	-	4,200	784	16,984	12.558	5.925
1937	26	3,689,200	3	1	4	49	57	18,000	6,000	5,400	1,619	31,019	15.451	8.408
1938	25	2,874,103	-	-	1	32	33	-	-	300	1,263	1,563	11.482	.544
1939	27	3,043,236	2	-	4	39	45	12,000	-	2,070	1,241	15,311	14.787	5.031
1940	27	3,332,960	1	-	4	46	51	6,000	-	5,400	2,071	13,471	15.302	4.042
1941	29	4,466,127	1	-	10	86	97	6,000	-	15,750	2,289	24,039	21.719	5.383
1942	35	5,736,739	4	-	7	198	209	24,000	-	8,297	4,687	36,984	36.432	6.447
1943	32	4,508,956	1	-	9	138	148	6,000	-	7,074	3,391	16,465	32.824	3.652
1944	27	4,358,112	2	-	5	162	169	12,000	-	5,550	3,877	21,427	38.778	4.917
1945	29	4,366,331	5	-	7	134	146	30,000	-	5,100	3,229	38,329	33.438	8.778
1946	34	5,331,175	5	1	11	168	185	30,000	6,000	5,373	4,208	45,581	34.702	8.550
1947	32	4,714,229	8	-	6	120	134	48,000	-	4,785	3,304	56,089	28.425	11.898
Total	-	78,737,144	57	2	96	2,384	2,539	342,000	12,000	87,074	58,035	499,109	32.247	6.339

1/ P.T., permanent total disability; P.P., permanent partial disability; Temp., Temp., temporary disability.
2/ Frequency rate indicates the number of fatal, permanent, andother lost-time injuries per million man-hours of exposure; severity rate indicates number of days lost from injuries per thousand man-hours.

TABLE 8A. - Injury experience of each NONMETAL mine enrolled in the National Safety Competition of 1947 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	314,310	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	168,878	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	88,238	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	62,311	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	52,819	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	31,144	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	300,769	-	-	-	3	3	21	-	-	-	63	63	9.974	.209
8	139,392	-	-	-	2	2	16	-	-	-	31	31	14.348	.222
9	31,965	-	-	-	1	1	8	-	-	-	8	8	31.284	.250
10	110,066	-	-	-	2	2	28	-	-	-	56	56	18.171	.509
11	96,480	-	-	-	3	3	20	-	-	-	60	60	31.095	.622
12	72,384	-	-	-	1	1	46	-	-	-	46	46	13.815	.635
13	161,462	-	-	-	12	12	10	-	-	-	117	117	74.321	.725
14	67,606	-	-	-	2	2	26	-	-	-	51	51	29.583	.754
15	82,501	-	-	-	2	2	32	-	-	-	64	64	24.242	.776
16	168,584	-	-	1	2	3	11	-	-	150	21	171	17.795	1.014
17	112,110	-	-	-	7	7	19	-	-	-	132	132	62.439	1.177
18	38,799	-	-	-	1	1	46	-	-	-	46	46	25.774	1.186
19	888,361	-	-	1	37	38	10	-	-	900	353	1,253	42.775	1.410
20	61,875	-	-	-	1	1	90	-	-	-	90	90	16.162	1.455
21	144,090	-	-	-	3	3	72	-	-	-	216	216	20.820	1.499
22	31,701	-	-	1	-	1	-	-	-	75	-	75	31.545	2.366
23	179,987	-	-	1	4	5	83	-	-	360	333	693	27.780	3.850
24	46,753	-	-	-	2	2	125	-	-	-	249	249	42.778	5.326
25	371,604	1	-	-	18	19	57	6,000	-	-	1,029	7,029	51.130	18.915
26	307,008	1	-	-	2	3	41	6,000	-	-	81	6,081	9.772	19.807
27	292,248	2	-	-	2	4	68	12,000	-	-	135	12,135	13.687	41.523
28	68,117	-	-	2	5	7	7	-	-	3,300	37	3,337	102.764	48.989
29	72,016	1	-	-	2	3	10	6,000	-	-	19	6,019	41.657	83.579
30	72,000	1	-	-	2	3	13	6,000	-	-	26	6,026	41.667	83.694
31	55,440	1	-	-	3	4	8	6,000	-	-	24	6,024	72.150	108.658
32	23,211	1	-	-	1	2	17	6,000	-	-	17	6,017	86.166	259.231
Totals and averages 1947	4,714,229	8	-	6	120	134	28	48,000	-	4,785	3,304	56,089	28.425	11.898
1946	5,331,175	5	1	11	168	185	25	30,000	6,000	5,373	4,208	45,581	34.702	8.550

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates the number of days lost from injuries per thousand man-hours.

TABLE 8B. - Injury experience of each NONMETAL mine enrolled in the National Safety Competition of 1946 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	292,000	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	142,721	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	136,844	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	89,184	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	81,319	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	73,522	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	52,160	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	48,353	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	93,912	-	-	-	1	1	5	-	-	-	5	5	10.648	.053
10	37,327	-	-	-	1	1	2	-	-	-	2	2	26.790	.054
11	159,020	-	-	-	1	1	20	-	-	-	20	20	6.289	.126
12	76,480	-	-	-	3	3	5	-	-	-	14	14	39.226	.183
13	284,616	-	-	-	2	2	31	-	-	-	61	61	7.027	.214
14	245,099	-	-	-	3	3	33	-	-	-	66	66	12.240	.269
15	69,953	-	-	-	1	1	19	-	-	-	19	19	14.295	.272
16	86,336	-	-	-	1	1	41	-	-	-	41	41	11.583	.475
17	384,499	-	-	1	6	7	10	-	-	150	60	210	18.206	.546
18	38,221	-	-	-	2	2	16	-	-	-	32	32	52.327	.837
19	834,452	-	-	2	59	61	9	-	-	260	541	801	73.102	.960
20	319,652	-	-	-	10	10	38	-	-	-	382	382	31.284	1.195
21	312,653	-	-	-	9	9	45	-	-	-	407	407	28.786	1.302
22	93,492	-	-	-	8	8	22	-	-	-	173	173	85.569	1.850
23	163,584	-	-	1	2	3	12	-	-	323	24	347	18.339	2.121
24	51,657	-	-	-	5	5	35	-	-	-	176	176	96.792	3.407
25	60,786	-	-	-	3	3	153	-	-	-	460	460	49.353	7.568
26	73,351	-	-	1	2	3	3	-	-	600	5	605	40.899	8.248
27	98,698	-	-	1	-	1	-	-	-	900	-	900	10.132	9.119
28	26,942	-	-	1	3	4	12	-	-	300	37	337	148.467	12.508
29	246,412	1	-	-	17	18	13	6,000	-	-	213	6,213	73.048	25.214
30	56,400	-	-	1	5	6	32	-	-	1,800	161	1,961	106.383	34.770
31	299,561	2	-	2	1	5	14	12,000	-	675	14	12,689	16.691	42.359
32	137,235	1	-	-	19	20	51	6,000	-	-	960	6,960	145.735	50.716
33	97,758	1	-	1	1	3	170	6,000	-	365	170	6,535	30.688	66.849
34	66,976	-	1	-	3	4	55	-	6,000	-	165	6,165	59.723	92.048
Totals and averages 1946	5,331,175	5	1	11	168	185	25	30,000	6,000	5,373	4,208	45,581	34.702	8.550
1945	4,366,331	5	-	7	134	146	24	30,000	-	5,100	3,229	38,329	33.438	8.778

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates the number of days lost from injuries per thousand man-hours.

TABLE 8C. - Injury experience of each NONMETAL mine enrolled in the National Safety Competition of 1945 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	103,787	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000 4/
2	71,760	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	64,638	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	56,436	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	37,376	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	36,250	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	29,660	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	14,784	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	217,536	-	-	-	1	1	3	-	-	-	3	3	4.597	.014
10	78,300	-	-	-	2	2	9	-	-	-	17	17	25.543	.217
11	283,518	-	-	-	2	2	52	-	-	-	104	104	6.932	.360
12	279,214	-	-	-	4	4	30	-	-	-	121	121	14.326	.433
13	141,787	-	-	-	5	5	13	-	-	-	67	67	35.264	.473
14	266,389	-	-	-	7	7	20	-	-	-	138	138	26.277	.518
15	70,175	-	-	-	2	2	26	-	-	-	51	51	28.500	.727
16	426,753	-	-	1	8	9	36	-	-	150	287	437	21.089	1.024
17	268,173	-	-	1	-	1	-	-	-	300	-	300	3.729	1.119
18	85,575	-	-	-	2	2	51	-	-	-	102	102	23.371	1.192
19	39,512	-	-	-	2	2	26	-	-	-	51	51	50.618	1.291
20	60,207	-	-	-	1	1	80	-	-	-	80	80	16.609	1.329
21	772,458	-	-	1	64	65	13	-	-	750	824	1,574	84.147	2.038
22	125,134	-	-	-	20	20	13	-	-	-	262	262	159.829	2.094
23	173,040	-	-	1	5	6	92	-	-	300	462	762	34.674	4.404
24	399,360	-	-	1	1	2	270	-	-	1,800	270	2,070	5.008	5.183
25	50,866	-	-	-	3	3	117	-	-	-	352	352	58.978	6.920
26	56,784	-	-	1	-	1	-	-	-	600	-	600	17.611	10.566
27	27,008	-	-	1	1	2	6	-	-	1,200	6	1,206	74.052	44.653
28	88,580	2	-	-	4	6	8	12,000	-	-	32	12,032	67.735	135.832
29	36,271	3	-	-	-	3	-	18,000	-	-	-	18,000	82.711	496.264
Totals and averages 1945	4,366,331	5	-	7	134	146	24	30,000	-	5,100	3,229	38,329	33.438	8.778
1944	4,358,112	2	-	5	162	169	24	12,000	-	5,550	3,877	21,427	38.778	4.917

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates the number of days lost from injuries per thousand man-hours.

4/ Mine is not eligible for the trophy because it did not employ 25 men underground as required in the contest rules.

TABLE 8D. - Injury experience of each NONMETAL mine enrolled in the National Safety Competition of 1944 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	120,723	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	77,428	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	57,861	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	55,432	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	42,578	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	91,535	-	-	-	4	4	9	-	-	-	35	35	43.699	.382
7	167,326	-	-	-	6	6	16	-	-	-	93	93	35.858	.556
8	748,219	-	-	-	49	49	11	-	-	-	538	538	65.489	.719
9	47,270	-	-	-	1	1	34	-	-	-	34	34	21.155	.719
10	208,593	-	-	-	3	3	56	-	-	-	167	167	14.382	.801
11	63,602	-	-	-	3	3	17	-	-	-	52	52	47.168	.818
12	403,662	-	-	-	7	7	47	-	-	-	332	332	17.341	.822
13	128,765	-	-	-	5	5	27	-	-	-	134	134	38.830	1.041
14	73,812	-	-	-	1	1	81	-	-	-	81	81	13.548	1.097
15	25,760	-	-	-	1	1	33	-	-	-	33	33	38.820	1.281
16	194,038	-	-	-	21	21	13	-	-	-	269	269	108.226	1.386
17	21,850	-	-	-	1	1	36	-	-	-	36	36	45.767	1.648
18	61,606	-	-	-	1	1	111	-	-	-	111	111	16.232	1.802
19	115,097	-	-	-	13	13	16	-	-	-	208	208	112.948	1.807
20	286,004	-	-	1	5	6	54	-	-	300	269	569	20.979	1.989
21	67,692	-	-	-	1	1	216	-	-	-	216	216	14.773	3.191
22	301,174	-	-	2	4	6	32	-	-	1,050	128	1,178	19.922	3.911
23	62,765	-	-	-	1	1	335	-	-	-	335	335	15.932	5.337
24	328,082	-	-	1	11	12	11	-	-	1,800	120	1,920	36.576	5.852
25	288,750	-	-	1	4	5	43	-	-	2,400	171	2,571	17.316	8.904
26	267,403	1	-	-	18	19	27	6,000	-	-	491	6,491	71.054	24.274
27	51,085	1	-	-	2	3	12	6,000	-	-	24	6,024	58.726	117.921
Totals and averages 1944	4,358,112	2	0	5	162	169	24	12,000	0	5,550	3,877	21,427	38.778	4.917
1943	4,508,956	1	0	9	138	148	25	6,000	0	7,074	3,391	16,465	32.824	3.652

1/ As reports from mining companies are considered confidential by the Bureau of mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal, P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates the number of days lost from injuries per thousand man-hours.

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OPEN-PIT GROUP

Summary

All winners of awards in the open-pit group in the past four competitions have been mines that have incurred no lost-time injuries. Therefore, the winners of "Sentinels of Safety" trophies were those operations that worked the most injury-free man-hours each year. In two of the 4 years covered by this report, 1947 and 1945, the Mahoning mine of Pickands Mather & Co., Hibbing, St. Louis County, Minn., had the best safety record. This mine has compiled an impressive safety record since it entered the National Safety Competition in 1930. In 11 years of this 18-year period it has operated without a disabling injury and has won the "Sentinels of Safety" trophy 7 times.

During the past 4 years, the group record has been quite favorable. The severity rate of 1.992 in 1944 was the second lowest for the group in the 23 years of the competition. The frequency rates for the 4-year period were well below the average for the group in every year except 1946, when the rate of 20.192 was the highest since 1933. The injury-severity rate of 2.131 and the frequency rate of 13.797 in 1947 mark a favorable reduction from the comparatively high rates of 1946. The enrollment of 66 open-pits in the 1947 competition was 2 less than the record number in 1946. The total worktime of 17,104,922 man-hours in 1947 was far greater than that of any other contest year.

Table 9 summarizes the injury experience of the open-pit group in the 23 years of the National Safety Competition. Tables 10A, 10B, 10C, and 10D record the injury experience of mines, in order of rank in the contest, enrolled in the competitions of 1947, 1946, 1945, and 1944, respectively. Operations that won "Sentinels of Safety" trophies and Certificates of Achievement in Safety in the competitions of the past 4 years are listed below.

Awards in the Competitions, 1947-44

The winners of "Sentinels of Safety" trophies in open-pit group were as follows:

1947

Mahoning iron-ore mine, Hibbing, St. Louis County, Minn., operated by Pickands Mather & Co. (Mahoning Ore & Steel Co.), 365,157 man-hours without a lost-time injury.

1946

Rouchleau iron-ore mine, Virginia, St. Louis County, Minn., operated by Oliver Iron Mining Co., 894,346 man-hours without a lost-time injury.

1945

Mahoning iron-ore mine, Hibbing, St. Louis County, Minn., operated by Pickands Mather & Co. (Mahoning Ore & Steel Co.), 367,152 man-hours without a lost-time injury.

1944

Danube iron-ore mine, Bovey, Itasca County, Minn., operated by Pickands Mather & Co. (Balkan Mining Co.), 364,558 man-hours without a lost-time injury.

The winners of Certificates of Achievement in Safety in the open-pit group all of whom operated for the year without a lost-time injury, were as follows:

1947

Corsica iron-ore mine, Elcor, St. Louis County, Minn., operated by Pickands Mather & Co. (Corsica Iron Co.), 209,913 man-hours.

Sagamore iron-ore mine, Riverton, Crow Wing County, Minn., operated by Pickands Mather & Co. (Sagamore Ore Mining Co.), 208,883 man-hours.

Albany iron-ore mine, Hibbing, St. Louis County, Minn., operated by Pickands Mather & Co. (Crete Mining Co.), 180,961 man-hours.

Pillsbury iron-ore mine, Chisholm, St. Louis County, Minn., operated by Oliver Iron Mining Co., 171,519 man-hours.

Hartley iron-ore mine, Chisholm, St. Louis County, Minn., operated by Oliver Iron Mining Co., 154,700 man-hours.

Biwabik iron-ore mine, Biwabik, St. Louis County, Minn., operated by Pickands Mather & Co. (Biwabik Mining Co.), 150,966 man-hours.

Patrick Group iron-ore mine, Cooley, Itasca County, Minn., operated by The M. A. Hanna Co. (Butler Brothers), 150,899 man-hours.

No. 18 bituminous-coal mine, West Mineral, Cherokee County, Kans., operated by The Pittsburg & Midway Coal Mining Co., 127,871 man-hours.

Columbia phosphate mine, Columbia, Maury County, Tenn., operated by Monsanto Chemical Co., 109,731 man-hours.

St. Paul iron-ore mine, Keewatin, Itasca County, Minn., operated by Republic Steel Corp., 103,999 man-hours.

Godfrey Glen iron-ore mine, Chisholm, St. Louis County, Minn., operated by Oliver Iron Mining Co., 85,688 man-hours.

Stevenson iron-ore mine, Stevenson, St. Louis County, Minn., operated by Republic Steel Corp., 75,057 man-hours.

Cross Creek bituminous-coal mine, Steubenville, Jefferson County, Ohio, operated by R. G. P. Coal Co., 60,160 man-hours.

Sayre bituminous-coal mine, Sayre, Jefferson County, Ala., operated by Republic Steel Corp., 47,769 man-hours.

Volunteer iron-ore mine, Palmer, Marquette County, Mich., operated by Pickands Mather & Co. (Palmer Mining Co.), 40,580 man-hours.

Richmond iron-ore mine, Palmer, Marquette County, Mich., operated by The M. A. Hanna Co. (Richmond Iron Co.), 37,833 man-hours.

1946

Mahoning iron-ore mine, Hibbing, St. Louis County, Minn., operated by Pickands Mather & Co. (Mahoning Ore & Steel Co.), 268,555 man-hours.

Susquehanna iron-ore mine, Hibbing, St. Louis County, Minn., operated by Republic Steel Corp., 219,772 man-hours.

Bennett iron-ore mine, Keewatin, Itasca County, Minn., operated by Pickands Mather & Co. (Bennett Mining Co.), 130,456 man-hours.

Sagamore iron-ore mine, Crosby, Crow Wing County, Minn., operated by Pickands Mather & Co. (Sagamore Ore Mining Co.), 130,444 man-hours.

Wabigon iron-ore mine, Buhl, St. Louis County, Minn., operated by Hanna Ore Mining Co., 127,401 man-hours.

Gross Marble iron-ore mine, Marble, Itasca County, Minn., operated by Oliver Iron Mining Co., 120,455 man-hours.

Prindle iron-ore mine, Virginia, St. Louis County, Minn., operated by Oliver Iron Mining Co., 119,134 man-hours.

Columbia phosphate mine, Columbia, Maury County, Tenn., operated by Monsanto Chemical Co., 94,542 man-hours.

St. Paul iron-ore mine, Keewatin, Itasca County, Minn., operated by Republic Steel Corp., 92,869 man-hours.

Erie iron-ore mine, Hibbing, St. Louis County, Minn., operated by Pickands Mather & Co. (Erie Mining Co.), 82,601 man-hours.

Hawkins iron-ore mine, Nashwauk, Itasca County, Minn., operated by International Harvester Co., 75,682 man-hours.

Stevenson iron-ore mine, Hibbing, St. Louis County, Minn., operated by Republic Steel Corp., 73,604 man-hours.

Cross Creek bituminous-coal mine, Steubenville, Jefferson County, Ohio, operated by R. C. P. Coal Co., 72,726 man-hours.

Sayre bituminous-coal mine, Sayre, Jefferson County, Ala., operated by Republic Steel Corp., 46,037 man-hours.

Hartley iron-ore mine, Fraser, St. Louis County, Minn., operated by Oliver Iron Mining Co., 41,944 man-hours.

Richmond iron-ore mine, Palmer, Marquette County, Mich., operated by The M. A. Hanna Co. (Richmond Iron Co.), 36,306 man-hours.

York iron-ore mine, Nashwauk, Itasca County, Minn., operated by York Iron Mining Co., 35,694 man-hours.

McArthur bituminous-coal mine, McArthur, Vinton County, Ohio, operated by Benedict & Sherman Coal Mining Co., 34,528 man-hours.

1945

Sagamore iron-ore mine, Riverton, Crow Wing County, Minn., operated by Pickands Mather & Co. (Sagamore Ore Mining Co.), 200,399 man-hours.

Corsica iron-ore mine, Elcor, St. Louis County, Minn., operated by Pickands Mather & Co. (Corsica Iron Co.), 197,735 man-hours.

Bennett iron-ore mine, Keewatin, Itasca County, Minn., operated by Pickands Mather & Co. (Bennett Mining Co.), 179,646 man-hours.

Biwabik iron-ore mine, Biwabik, St. Louis County, Minn., operated by Pickands Mather & Co. (Biwabik Mining Co.), 124,737 man-hours.

Columbia phosphate mine, Columbia, Maury County, Tenn., operated by Monsanto Chemical Co., 118,588 man-hours.

St. Paul iron-ore mine, Keewatin, Itasca County, Minn., operated by Republic Steel Corp., 103,655 man-hours.

Richmond iron-ore mine, Palmer, Marquette County, Mich., operated by The M. A. Hanna Co. (Richmond Iron Co.), 51,589 man-hours.

Harrison Group iron-ore mine, Cooley, Itasca County, Minn., operated by The M. A. Hanna Co. (Butler Brothers), 45,344 man-hours.

Prenter bituminous-coal mine, Prenter, Boone County, W. Va., operated by the Red Parrot Coal Co., 44,644 man-hours.

Volunteer iron-ore mine, Palmer, Marquette County, Mich., operated by Pickands Mather & Co. (Palmer Mining Co.), 34,401 man-hours.

1944

Bennett iron-ore mine, Keewatin, Itasca County, Minn., operated by Pickands Mather & Co. (Bennett Mining Co.), 178,552 man-hours.

LaGrange No. 1 iron-ore mine, Leighton, Colbert County, Ala., operated by Sloss-Sheffield Steel & Iron Co., 165,304 man-hours.

Albany iron-ore mine, Hibbing, St. Louis County, Minn., operated by Pickands Mather & Co. (Crete Mining Co.), 159,282 man-hours.

St. Paul iron-ore mine, Keewatin, Itasca County, Minn., operated by Republic Steel Corp., 120,439 man-hours.

Biwabik iron-ore mine, Biwabik, St. Louis County, Minn., operated by Pickands Mather & Co. (Biwabik Mining Co.), 117,885 man-hours.

Columbia phosphate-rock mine, Columbia, Maury County, Tenn., operated by Monsanto Chemical Co., 115,507 man-hours.

Plymouth iron-ore mine, Wakefield, Gogebic County, Mich., operated by Pickands Mather & Co. (Plymouth Mining Co.), 115,184 man-hours.

Forsyth-Carterville bituminous-coal mine, Carterville, Williamson County, Ill., operated by Forsyth Carterville Coal Co., 58,270 man-hours.

Richmond iron-ore mine, Palmer, Marquette County, Mich., operated by The M. A. Hanna Co. (Richmond Iron Co.), 44,184 man-hours.

Dunwoody iron-ore mine, Chisholm, St. Louis County, Minn., operated by Pickands Mather & Co. (Dunwoody Iron Co.), 42,991 man-hours.

Erie iron-ore mine, Hibbing, St. Louis County, Minn., operated by Pickands Mather & Co. (Erie Mining Co.), 37,547 man-hours.

Volunteer iron-ore mine, Palmer, Marquette County, Mich., operated by Pickands Mather & Co. (Palmer Mining Co.), 34,724 man-hours

TABLE 9. - Injury experience of OPEN-PIT group in the National Safety Competition, 1925-47, by years.

Year	Number of mines	Man-hours	Number of injuries 1/					Number of days of disability 1/					Frequency rate 2/	Severity rate 2/
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925	5	6,199,114	4	-	7	403	414	24,000	-	9,300	3,838	37,138	66.784	5.991
1926	6	6,466,877	8	-	3	457	468	48,000	-	5,700	5,443	59,143	72.369	9.146
1927	8	6,039,685	3	-	8	189	200	18,000	-	9,000	3,668	30,668	33.114	5.078
1928	7	1,326,456	-	-	1	67	68	-	-	3,000	1,505	4,505	51.264	3.396
1929	11	1,517,929	2	-	-	34	36	12,000	-	-	419	12,419	23.717	8.182
1930	18	3,732,389	1	-	1	50	52	6,000	-	600	926	7,526	13.932	2.016
1931	30	7,018,316	-	-	1	118	119	-	-	300	3,235	3,535	16.956	.504
1932	29	4,441,813	3	-	3	129	135	18,000	-	1,700	2,712	22,412	30.393	5.046
1933	27	3,543,023	1	-	8	106	115	6,000	-	6,238	1,653	13,891	32.458	3.921
1934	24	3,694,428	2	-	2	41	45	12,000	-	3,300	1,204	16,504	12.181	4.467
1935	20	2,528,422	1	-	3	38	42	6,000	-	5,100	1,032	12,132	16.611	4.798
1936	23	3,821,312	2	-	6	63	71	12,000	-	2,700	1,647	16,347	18.580	4.278
1937	22	5,048,961	3	-	3	58	64	18,000	-	5,400	1,884	25,284	12.676	5.008
1938	22	5,567,062	1	-	3	20	24	6,000	-	5,175	618	11,793	4.311	2.118
1939	27	8,245,031	2	-	7	87	96	12,000	-	6,600	1,966	20,566	11.643	2.494
1940	26	9,589,519	4	-	6	88	98	24,000	-	4,800	3,294	32,094	10.219	3.347
1941	31	11,292,986	3	-	9	85	97	18,000	-	9,000	3,075	30,075	8.589	2.663
1942	38	12,757,227	4	-	8	151	163	24,000	-	5,253	2,943	32,196	12.777	2.524
1943	51	14,101,071	9	-	13	235	257	54,000	-	12,488	5,852	72,340	18.226	5.130
1944	49	12,140,093	2	-	5	168	175	12,000	-	6,900	5,277	24,177	14.415	1.992
1945	58	13,927,618	3	-	10	224	237	18,000	-	10,770	5,276	34,046	17.017	2.444
1946	68	13,272,755	5	1	11	251	268	30,000	6,000	9,225	7,973	53,198	20.192	4.008
1947	66	17,104,992	4	-	7	225	236	24,000	-	6,300	6,143	36,443	13.797	2.131
Total	-	173,377,079	67	1	125	3,287	3,480	402,000	6,000	128,849	71,583	608,432	20.072	3.509

1/ P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

2/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days lost from injuries per thousand man-hours.

TABLE 10A. - Injury experience of each OPEN-PIT mine enrolled in the National Safety Competition of 1947 1/

Rank	Man-hours worked	Number of injuries					Average days of disability per temp. injury	Number of days of disability					Frequency rate	Severity rate
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	365,157	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	209,913	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	208,883	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	180,961	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	171,519	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	154,700	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	150,966	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	150,899	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	127,871	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	109,731	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	103,999	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	85,688	-	-	-	-	-	-	-	-	-	-	-	.000	.000
13	75,057	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	60,160	-	-	-	-	-	-	-	-	-	-	-	.000	.000
15	47,769	-	-	-	-	-	-	-	-	-	-	-	.000	.000
16	40,580	-	-	-	-	-	-	-	-	-	-	-	.000	.000
17	37,833	-	-	-	-	-	-	-	-	-	-	-	.000	.000
18	26,409	-	-	-	-	-	-	-	-	-	-	-	.000	.000
19	22,641	-	-	-	-	-	-	-	-	-	-	-	.000	.000
20	13,803	-	-	-	-	-	-	-	-	-	-	-	.000	.000
21	167,860	-	-	-	2	2	2	-	-	-	3	3	11.915	.018
22	125,316	-	-	-	1	1	4	-	-	-	4	4	7.980	.032
23	338,342	-	-	-	2	2	7	-	-	-	14	14	5.911	.041
24	181,868	-	-	-	1	1	13	-	-	-	13	13	5.498	.071
25	33,778	-	-	-	1	1	3	-	-	-	3	3	29.605	.089
26	173,809	-	-	-	1	1	17	-	-	-	17	17	5.753	.098
27	676,206	-	-	-	2	2	37	-	-	-	74	74	2.958	.109
28	141,800	-	-	-	1	1	16	-	-	-	16	16	7.052	.113
29	721,532	-	-	-	1	1	98	-	-	-	98	98	1.386	.136
30	201,719	-	-	-	1	1	38	-	-	-	38	38	4.957	.188
31	193,952	-	-	-	3	3	15	-	-	-	46	46	15.468	.237
32	57,242	-	-	-	1	1	15	-	-	-	15	15	17.470	.262
33	338,045	-	-	-	1	1	97	-	-	-	97	97	2.958	.287
34	306,708	-	-	-	12	12	8	-	-	-	91	91	39.125	.297
35	240,728	-	-	-	4	4	18	-	-	-	73	73	16.616	.303
36	479,771	-	-	1	1	2	3	-	-	150	3	153	4.169	.319
37	79,598	-	-	-	3	3	9	-	-	-	28	28	37.689	.352
38	184,318	-	-	-	5	5	13	-	-	-	65	65	27.127	.353
39	380,458	-	-	-	15	15	10	-	-	-	143	143	39.426	.376
40	901,567	-	-	-	2	2	187	-	-	-	374	374	2.218	.415
41	151,861	-	-	-	6	6	11	-	-	-	67	67	39.510	.441
42	123,988	-	-	-	1	1	56	-	-	-	56	56	8.065	.452
43	156,642	-	-	-	2	2	39	-	-	-	77	77	12.768	.492
44	611,570	-	-	-	9	9	35	-	-	-	319	319	14.716	.522
45	336,883	-	-	-	6	6	30	-	-	-	177	177	17.810	.525
46	265,127	-	-	-	10	10	15	-	-	-	146	146	37.718	.551
47	285,718	-	-	-	6	6	29	-	-	-	175	175	21.000	.612
48	119,784	-	-	-	3	3	25	-	-	-	74	74	25.045	.618
49	104,462	-	-	-	6	6	11	-	-	-	66	66	57.437	.632
50	96,961	-	-	-	4	4	19	-	-	-	75	75	41.254	.774
51	212,785	-	-	-	1	1	167	-	-	-	167	167	4.700	.785
52	231,979	-	-	-	11	11	17	-	-	-	188	188	47.418	.810
53	379,423	-	-	-	3	3	123	-	-	-	368	368	7.907	.970
54	595,696	-	-	-	18	18	36	-	-	-	652	652	30.217	1.095
55	89,749	-	-	-	5	5	20	-	-	-	102	102	55.711	1.137
56	149,182	-	-	-	4	4	46	-	-	-	183	183	26.813	1.227
57	1,262,248	-	-	1	22	23	14	-	-	1,500	310	1,810	18.221	1.434
58	99,022	-	-	-	2	2	82	-	-	-	164	164	20.198	1.656
59	83,062	-	-	1	1	2	6	-	-	150	6	156	24.078	1.878
60	2,337,198	-	-	2	21	23	35	-	-	3,675	730	4,405	9.841	1.885
61	74,250	-	-	-	3	3	47	-	-	-	142	142	40.404	1.912
62	379,182	-	-	1	1	2	178	-	-	750	178	928	5.275	2.447
63	25,361	-	-	-	4	4	20	-	-	-	78	78	157.722	3.076
64	274,309	1	-	1	2	4	102	6,000	-	75	203	6,278	14.582	22.887
65	334,246	2	-	-	14	16	16	12,000	-	-	225	12,225	47.869	36.575
66	55,148	1	-	-	-	1	-	6,000	-	-	-	6,000	18.133	108.798
Totals and averages 1947	17,104,992	4	-	7	225	236	27	24,000	-	6,300	6,143	36,443	13.797	2.131
1946	13,272,755	5	1	11	251	268	32	30,000	6,000	9,225	7,973	53,198	20.192	4.008

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this plant relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

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TABLE 10B. - Injury experience of each OPEN-PIT mine enrolled in the National Safety Competition of 1946 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	894,346	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	268,555	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	219,772	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	130,456	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	130,444	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	127,401	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	120,455	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	119,134	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	94,542	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	92,869	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	82,601	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	75,682	-	-	-	-	-	-	-	-	-	-	-	.000	.000
13	73,604	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	72,726	-	-	-	-	-	-	-	-	-	-	-	.000	.000
15	46,037	-	-	-	-	-	-	-	-	-	-	-	.000	.000
16	41,944	-	-	-	-	-	-	-	-	-	-	-	.000	.000
17	36,306	-	-	-	-	-	-	-	-	-	-	-	.000	.000
18	35,694	-	-	-	-	-	-	-	-	-	-	-	.000	.000
19	34,528	-	-	-	-	-	-	-	-	-	-	-	.000	.000
20	26,111	-	-	-	-	-	-	-	-	-	-	-	.000	.000
21	18,087	-	-	-	-	-	-	-	-	-	-	-	.000	.000
22	16,710	-	-	-	-	-	-	-	-	-	-	-	.000	.000
23	118,968	-	-	-	1	1	4	-	-	-	4	4	8.406	.034
24	44,416	-	-	-	2	2	2	-	-	-	3	3	45.029	.068
25	87,584	-	-	-	1	1	6	-	-	-	6	6	11.418	.069
26	414,521	-	-	-	2	2	17	-	-	-	33	33	4.825	.080
27	344,063	-	-	-	1	1	38	-	-	-	38	38	2.906	.110
28	313,486	-	-	-	6	6	10	-	-	-	59	59	19.140	.188
29	272,526	-	-	-	1	1	70	-	-	-	70	70	3.669	.257
30	88,494	-	-	-	6	6	4	-	-	-	26	26	67.801	.294
31	103,154	-	-	-	2	2	16	-	-	-	32	32	19.388	.310
32	195,300	-	-	-	5	5	12	-	-	-	62	62	25.602	.317
33	118,073	-	-	-	1	1	38	-	-	-	38	38	8.469	.322
34	228,148	-	-	-	2	2	56	-	-	-	112	112	8.755	.490
35	93,822	-	-	-	1	1	46	-	-	-	46	46	10.658	.490
36	39,520	-	-	-	1	1	20	-	-	-	20	20	25.304	.506
37	136,293	-	-	-	8	8	10	-	-	-	78	78	58.697	.572
38	86,481	-	-	-	1	1	50	-	-	-	50	50	11.563	.578
39	79,245	-	-	-	4	4	13	-	-	-	52	52	50.476	.656
40	666,049	-	-	-	14	14	32	-	-	-	442	442	21.019	.664
41	141,248	-	-	-	5	5	21	-	-	-	104	104	35.399	.736
42	259,850	-	-	-	12	12	16	-	-	-	192	192	46.180	.739
43	58,078	-	-	-	2	2	22	-	-	-	44	44	34.436	.758
44	96,344	-	-	-	3	3	28	-	-	-	83	83	31.138	.861
45	106,988	-	-	-	3	3	32	-	-	-	96	96	28.041	.897
46	57,781	-	-	-	3	3	18	-	-	-	53	53	51.920	.917
47	273,421	-	-	-	8	8	33	-	-	-	263	263	29.295	.962
48	1,260,852	-	-	1	22	23	44	-	-	300	974	1,274	18.242	1.010
49	21,936	-	-	-	2	2	12	-	-	-	23	23	91.174	1.049
50	325,560	-	-	-	11	11	33	-	-	-	360	360	33.788	1.106
51	255,120	-	-	-	5	5	57	-	-	-	283	283	19.599	1.109
52	164,152	-	-	-	6	6	35	-	-	-	211	211	36.551	1.285
53	396,268	-	-	-	21	21	25	-	-	-	517	517	52.994	1.305
54	42,580	-	-	-	3	3	19	-	-	-	56	56	70.456	1.315
55	181,266	-	-	-	2	2	130	-	-	-	260	260	11.034	1.434
56	142,957	-	-	-	1	1	237	-	-	-	237	237	6.995	1.658
57	89,010	-	-	-	6	6	28	-	-	-	167	167	67.408	1.876
58	59,087	-	-	1	3	4	11	-	-	150	33	183	67.697	3.097
59	103,153	-	-	-	2	2	199	-	-	-	397	397	19.389	3.849
60	369,866	-	-	2	28	30	26	-	-	750	741	1,491	81.110	4.031
61	141,321	-	-	1	-	1	-	-	-	675	-	675	7.076	4.776
62	1,023,582	1	-	-	14	15	73	6,000	-	-	1,019	7,019	14.654	6.857
63	108,267	-	-	1	2	3	16	-	-	900	32	932	27.709	8.608
64	109,676	-	-	2	1	3	46	-	-	900	46	946	27.353	8.625
65	449,124	1	-	-	2	3	61	6,000	-	-	122	6,122	6.680	13.631
66	423,696	-	1	1	3	5	31	-	6,000	750	93	6,843	11.801	16.151
67	281,411	1	-	2	13	16	19	6,000	-	4,800	245	11,045	56.856	39.249
68	141,714	2	-	-	9	11	17	12,000	-	-	151	12,151	77.621	85.743
Totals and averages 1946	13,272,755	5	1	11	251	268	32	30,000	6,000	9,225	7,973	53,198	20.192	4.008
1945	13,927,618	3	-	10	224	237	24	18,000	-	10,770	5,276	34,046	17.017	2.444

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

TABLE 100. - Injury experience of each OPEN-PIT mine enrolled in the National Safety Competition of 1945 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.P.	P.T.	Temp.	Total		
1	367,152	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	200,399	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	197,735	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	179,646	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	124,737	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	118,588	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	103,655	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	51,589	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	45,344	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	44,644	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	34,401	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	33,097	-	-	-	-	-	-	-	-	-	-	-	.000	.000 4/
13	24,407	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	192,574	-	-	-	1	1	6	-	-	-	6	6	5.193	.031
15	184,600	-	-	-	3	3	2	-	-	-	6	6	16.251	.033
16	230,264	-	-	-	1	1	8	-	-	-	8	8	4.343	.035
17	87,978	-	-	-	1	1	6	-	-	-	6	6	11.366	.068
18	120,471	-	-	-	1	1	9	-	-	-	9	9	8.301	.075
19	297,117	-	-	-	2	2	14	-	-	-	28	28	6.731	.094
20	753,847	-	-	-	3	3	27	-	-	-	82	82	3.980	.109
21	772,652	-	-	-	4	4	28	-	-	-	111	111	5.177	.144
22	166,372	-	-	-	4	4	6	-	-	-	24	24	24.043	.144
23	197,304	-	-	-	1	1	33	-	-	-	33	33	5.068	.167
24	45,070	-	-	-	1	1	8	-	-	-	8	8	22.188	.178
25	59,000	-	-	-	2	2	6	-	-	-	11	11	33.898	.186
26	405,152	-	-	-	2	2	41	-	-	-	82	82	4.936	.202
27	151,319	-	-	-	3	3	11	-	-	-	32	32	19.826	.211
28	137,564	-	-	-	3	3	11	-	-	-	34	34	21.808	.247
29	98,123	-	-	-	1	1	28	-	-	-	28	28	10.191	.285
30	46,474	-	-	-	1	1	16	-	-	-	16	16	21.517	.344
31	310,252	-	-	-	10	10	12	-	-	-	121	121	32.232	.390
32	191,910	-	-	-	4	4	20	-	-	-	78	78	20.843	.406
33	112,320	-	-	-	2	2	27	-	-	-	53	53	17.806	.472
34	208,417	-	-	-	3	3	33	-	-	-	99	99	14.394	.475
35	183,563	-	-	-	3	3	31	-	-	-	94	94	16.343	.512
36	334,308	-	-	-	25	25	8	-	-	-	207	207	74.781	.619
37	40,788	-	-	-	2	2	14	-	-	-	27	27	49.034	.662
38	92,352	-	-	-	3	3	21	-	-	-	62	62	32.484	.671
39	382,421	-	-	-	21	21	14	-	-	-	301	301	54.913	.787
40	61,670	-	-	-	4	4	12	-	-	-	49	49	64.861	.795
41	204,589	-	-	-	13	13	14	-	-	-	186	186	63.542	.909
42	748,473	-	-	1	22	23	19	-	-	300	413	713	30.729	.953
43	293,184	-	-	-	3	3	110	-	-	-	331	331	10.232	1.129
44	73,724	-	-	-	2	2	50	-	-	-	100	100	27.128	1.356
45	127,372	-	-	-	3	3	58	-	-	-	173	173	23.553	1.358
46	118,186	-	-	-	5	5	33	-	-	-	165	165	42.306	1.396
47	239,665	-	-	-	10	10	41	-	-	-	407	407	41.725	1.698
48	168,108	-	-	1	-	1	-	-	-	300	-	300	5.949	1.785
49	318,672	-	-	1	6	7	10	-	-	600	59	659	21.966	2.068
50	2,378,800	1	-	2	12	15	27	6,000	-	420	328	6,748	6.306	2.837
51	94,274	-	-	-	3	3	109	-	-	-	327	327	31.822	3.469
52	87,377	-	-	1	1	2	9	-	-	300	9	309	22.889	3.536
53	115,675	-	-	1	5	6	35	-	-	300	175	475	51.869	4.106
54	38,669	-	-	-	1	1	159	-	-	-	159	159	25.861	4.112
55	385,332	-	-	1	7	8	17	-	-	1,800	118	1,918	20.761	4.978
56	256,406	-	-	1	5	6	12	-	-	2,250	61	2,311	23.400	9.013
57	539,390	1	-	-	15	16	43	6,000	-	-	650	6,650	29.663	12.329
58	350,446	1	-	1	-	2	-	6,000	-	4,500	-	10,500	5.707	29.962
Totals and averages 1945	13,927,618	3	-	10	224	237	24	18,000	-	10,770	5,276	34,046	17.017	2.444
1944	12,140,093	2	-	5	168	175	31	12,000	-	6,900	5,277	24.177	14.415	1.992

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

4/ The mine is not eligible for a Certificate of Honorable Mention because it does not meet the requirement of the rules of working a total of 30,000 man-hours in the pit.

TABLE 10D. - Injury experience of each OPEN-PIT mine enrolled in the National Safety Competition of 1944 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	364,558	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	178,552	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	165,304	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	159,282	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	120,439	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	117,885	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	115,507	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	115,184	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	58,270	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	44,184	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	42,991	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	37,547	-	-	-	-	-	-	-	-	-	-	-	.000	.000
13	34,724	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	18,848	-	-	-	-	-	-	-	-	-	-	-	.000	.000
15	18,409	-	-	-	-	-	-	-	-	-	-	-	.000	.000
16	62,559	-	-	-	2	2	1	-	-	-	2	2	31.970	.032
17	225,780	-	-	-	1	1	9	-	-	-	9	9	4.429	.040
18	172,038	-	-	-	2	2	9	-	-	-	17	17	11.625	.099
19	218,168	-	-	-	2	2	19	-	-	-	38	38	9.167	.174
20	171,065	-	-	-	2	2	16	-	-	-	31	31	11.691	.181
21	450,856	-	-	-	2	2	42	-	-	-	84	84	4.436	.186
22	56,994	-	-	-	2	2	6	-	-	-	12	12	35.091	.211
23	56,629	-	-	-	2	2	7	-	-	-	13	13	35.318	.230
24	330,812	-	-	-	9	9	10	-	-	-	86	86	27.206	.260
25	105,719	-	-	-	5	5	7	-	-	-	33	33	47.295	.312
26	227,694	-	-	-	3	3	24	-	-	-	72	72	13.176	.316
27	103,115	-	-	-	3	3	12	-	-	-	37	37	29.094	.359
28	133,469	-	-	-	5	5	10	-	-	-	52	52	37.462	.390
29	220,158	-	-	-	2	2	44	-	-	-	87	87	9.084	.395
30	378,445	-	-	-	10	10	19	-	-	-	193	193	26.424	.510
31	369,385	-	-	-	2	2	119	-	-	-	237	237	5.414	.642
32	224,654	-	-	-	1	1	149	-	-	-	149	149	4.451	.663
33	270,313	-	-	-	11	11	17	-	-	-	182	182	40.694	.673
34	111,902	-	-	-	3	3	27	-	-	-	80	80	26.809	.715
35	206,907	-	-	-	7	7	24	-	-	-	165	165	33.832	.797
36	1,112,999	-	-	1	16	17	38	-	-	300	601	901	15.274	.810
37	168,926	-	-	-	3	3	49	-	-	-	146	146	17.759	.864
38	671,185	-	-	-	20	20	34	-	-	-	679	679	29.798	1.012
39	79,504	-	-	-	3	3	29	-	-	-	86	86	37.734	1.082
40	299,685	-	-	-	16	16	22	-	-	-	353	353	53.389	1.178
41	133,824	-	-	-	14	14	12	-	-	-	170	170	104.615	1.270
42	197,559	-	-	-	2	2	131	-	-	-	261	261	10.124	1.321
43	82,345	-	-	-	1	1	142	-	-	-	142	142	12.144	1.724
44	116,571	-	-	-	2	2	111	-	-	-	222	222	17.157	1.904
45	434,310	-	-	1	1	2	35	-	-	1,200	35	1,235	4.605	2.844
46	2,141,168	1	-	1	9	11	89	6,000	-	600	798	7,398	5.137	3.455
47	421,745	-	-	1	1	2	27	-	-	3,000	27	3,027	4.742	7.177
48	195,584	-	-	1	1	2	14	-	-	1,800	14	1,814	10.226	9.275
49	396,342	1	-	-	3	4	55	6,000	-	-	164	6,164	10.092	15.552
Totals and averages 1944	12,140,093	2	0	5	168	175	31	12,000	0	6,000	5,277	24,177	14.415	1.992
1943	14,101,071	9	0	13	235	257	25	54,000	0	12,488	5,852	72,340	18.226	5.130

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T. permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

3416

QUARRY GROUP

Summary

All winners of awards in the quarry group in the past four competitions have been plants that have had perfect safety records for the year. As a result, the winners of "Sentinels of Safety" trophies were plants that worked the most injury-free man-hours each year. In 1947, alone, 74 quarries with no lost-time injuries during the year were enrolled in the contest. However, 10 of these were ineligible for awards as they did not satisfy the minimum requirement of 30,000 man-hours of exposure during the year. Of the 64 quarries selected for awards in the quarry group in 1947, the Dolonah quarry of Tennessee Coal, Iron & Railroad Co., at Bessemer, Jefferson County, Ala., had the best record, a total of 297,246 man-hours without a disabling injury. Since this quarry first entered the National Safety Competition in 1936, it has had 6 injury-free years of operation. In 3 of these years, 1940, 1941, and 1947, this plant has won the "Sentinels of Safety" trophy.

On the whole, the group record for the past 4 years is favorable. The frequency rates for the period and the severity rates of all years except 1944 are below the 23-year average for the group. A record number of 156 plants competed in the quarry group in 1947. In the total worktime of 18,992,142 man-hours, the group had an injury-severity rate of 4.489 and a frequency rate of 17.007. The injury-severity rate was more than double the record-low rate of 1.961, which was set in 1946, whereas the injury-frequency rate in 1947 represents an improvement over the corresponding rate of 18.897 in 1946. The fact that there were 11 fatalities in the quarry group in 1947 but only 2 in 1946 accounts for the wide disparity between the severity rates of the 2 years.

Table 11 summarizes the injury experience of the quarry group in the 23 years of the National Safety Competition. Tables 12A, 12B, 12C, and 12D record the injury experience of quarries, in order of rank in the contest, enrolled in the competitions of 1947, 1946, 1945, and 1944, respectively. Operations that won "Sentinels of Safety" trophies and Certificates of Achievement in Safety in the competitions of the past 4 years are listed below.

Awards in the Competitions, 1947-44

The winners of "Sentinels of Safety" trophies in the quarry group were as follows:

1947

Dolonah dolomite quarry, Bessemer, Jefferson County, Ala., operated by Tennessee Coal, Iron & Railroad Co., 297,246 man-hours without a lost-time injury.

1946

Bridgeport limestone quarry, Bridgeport, Montgomery County, Pa., operated by Bethlehem Steel Co., 322,374 man-hours without a lost-time injury.

1945

Bridgeport limestone quarry, Bridgeport, Montgomery County, Pa., operated by Bethlehem Steel Co., 379,948 man-hours without a lost-time injury.

1944

Maple Brove dolomite quarry, Maple Grove, Seneca County, Ohio, operated by Basic Refractories, Inc., 325,147 man-hours without a lost-time injury.

The winners of Certificates of Achievement in Safety in the quarry group, all having operated for the year without a lost-time injury, were as follows:

1947

Billmeyer dolomite quarry, Bainbridge, Lancaster County, Pa., operated by The J. E. Baker Co., 288,806 man-hours.

Hanover limestone quarry, Hanover, York County, Pa., operated by Bethlehem Steel Co., 222,332 man-hours.

Steelton limestone quarry, Steelton, Dauphin County, Pa., operated by Bethlehem Steel Co., 176,614 man-hours.

Dixon limestone quarry, Dixon, Lee County, Ill., operated by Medusa Portland Cement Co., 141,615 man-hours.

Jensen and Henshaw limestone quarries, Riverside, Riverside County, Calif., operated by Riverside Cement Co., 139,890 man-hours.

St. Stephens limestone quarry, St. Stephens, Washington County, Ala., operated by Lone Star Cement Corp., 130,979 man-hours.

Naginey limestone quarry, Naginey, Mifflin County, Pa., operated by Bethlehem Steel Co., 126,642 man-hours.

Oglesby limestone and shale quarry, Oglesby, La Salle County, Ill., operated by Marquette Cement Manufacturing Co., 126,157 man-hours.

Hudson limestone quarry, Hudson, Columbia County, N. Y., operated by Universal Atlas Cement Co., 122,656 man-hours.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Co., 116,068 man-hours.

Inwood limestone quarry, Inwood, Berkeley County, W. Va., operated by The J. E. Baker Co., 114,351 man-hours.

Bethlehem limestone quarry, Bethlehem, Northampton County, Pa., operated by Bethlehem Steel Co., 111,628 man-hours.

Frazier limestone quarry, East Fultonham, Muskingum County, Ohio, operated by Pittsburgh Plate Glass Co., 106,282 man-hours.

Northampton cement-rock quarry, Northampton, Northampton County, Pa., operated by Universal Atlas Cement Co., 105,129 man-hours.

Fogelsville limestone and cement-rock quarry, Fogelsville, Lehigh County, Pa., operated by Lehigh Portland Cement Co., 104,896 man-hours.

Birmingham limestone quarry, Birmingham, Jefferson County, Ala., operated by Lone Star Cement Corp., 100,518 man-hours.

La Salle cement-rock quarry, La Salle, La Salle County, Ill., operated by Alpha Portland Cement Co., 96,401 man-hours.

Mason City limestone quarry, Mason City, Cerro Gordo County, Iowa, operated by Lehigh Portland Cement Co., 94,799 man-hours.

Margerum limestone quarry, Margerum, Colbert County, Ala., operated by Alabama Asphaltic Limestone Co., 94,646 man-hours.

Rock Hill trap-rock quarry, Quakertown, Bucks County, Pa., operated by The General Crushed Stone Co., 93,869 man-hours.

Clinchfield limestone quarry, Clinchfield, Houston County, Ga., operated by Pennsylvania-Dixie Cement Corp., 91,014 man-hours.

Gay limestone and shale quarry, Fordwick, Augusta County, Va., operated by Lehigh Portland Cement Co., 90,616 man-hours.

Lawrence limestone and shale quarry, Fitzhugh, Pontotoc County, Okla., operated by Ideal Cement Co., 89,856 man-hours.

Winchester trap-rock quarry, Winchester, Middlesex County, Mass., operated by The General Crushed Stone Co., 86,460 man-hours.

Nazareth cement-rock quarry, Nazareth, Northampton County, Pa., operated by Lone Star Cement Corp., 85,914 man-hours.

Iola limestone and shale quarry, Iola, Allen County, Kans., operated by Lehigh Portland Cement Co., 83,533 man-hours.

Greencastle No. 2 limestone quarry, Greencastle, Putnam County, Ind., operated by Ohio and Indiana Stone Corp., 83,132 man-hours.

Keeport limestone quarry, Logansport, Cass County, Ind., operated by The France Stone Co., 82,684 man-hours.

Klondike limestone and shale quarry, Oro Grande, San Bernardino County, Calif., operated by Riverside Cement Co., 81,912 man-hours.

Permanente limestone quarry, Permanente, Santa Clara County, Calif., operated by Permanente Cement Co., 81,400 man-hours.

Hercules cement-rock quarry, Stockertown, Northampton County, Pa., operated by Hercules Cement Corp., 81,249 man-hours.

Holland limestone quarry, Holland, Lucas County, Ohio, operated by The France Stone Co., 80,020 man-hours.

Nazareth limestone quarry, Nazareth, Northampton County, Pa., operated by Nazareth Cement Co., 77,736 man-hours.

Blue Mount trap-rock quarry, Blue Mount, Baltimore County, Md., operated by The J. E. Baker Co., 76,323 man-hours.

Greencastle limestone quarry, Greencastle, Putnam County, Ind., operated by Lone Star Cement Corp., 75,717 man-hours.

Sandt's Eddy cement-rock quarry, Martin's Creek, Northampton County, Pa., operated by Lehigh Portland Cement Co., 74,634 man-hours.

Bellevue limestone quarry, Bellevue, Huron and Sandusky Counties, Ohio, operated by The France Stone Co., 74,187 man-hours.

Lone Star limestone quarry, Hudson, Columbia County, N. Y., operated by Lone Star Cement Corp., 71,712 man-hours.

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Portland limestone and shale quarry, Portland, Fremont County, Colo., operated by Ideal Cement Co., 71,391 man-hours.

Thomasville limestone quarry, Thomasville, York County, Pa., operated by The J. E. Baker Co., 69,036 man-hours.

Thomaston cement quarry, Thomaston, Knox County, Maine, operated by Lawrence Portland Cement Co., 68,667 man-hours.

Alsen limestone quarry, Alsen, Greene County, N. Y., operated by Lehigh Portland Cement Co., 66,918 man-hours.

Birmingham cement-rock quarry, Birmingham, Jefferson County, Ala., operated by Alpha Portland Cement Co., 65,568 man-hours.

Bonner Springs limestone quarry, Bonner Springs, Wyandotte County, Kans., operated by Lone Star Cement Corp., 65,338 man-hours.

Auburn limestone quarry, Auburn, Cayuga County, N. Y., operated by The General Crushed Stone Co., 64,576 man-hours.

No. 3 cement-rock quarry, West Coplay, Lehigh County, Pa., operated by Coplay Cement Manufacturing Co., 64,001 man-hours.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by Marquette Cement Manufacturing Co., 63,622 man-hours.

Diamond limestone quarry, Middle Branch, Stark County, Ohio, operated by Diamond Portland Cement Co., 62,928 man-hours.

National City gypsum quarry, National City, Iosco County, Mich., operated by National Gypsum Co., 59,002 man-hours.

Union Bridge limestone quarry, Union Bridge, Carroll County, Md., operated by Lehigh Portland Cement Co., 58,280 man-hours.

Bloomville limestone quarry, Bloomville, Seneca County, Ohio, operated by The France Stone Co., 57,755 man-hours.

Sylvania limestone quarry, Sylvania, Lucas County, Ohio, operated by Medusa Portland Cement Co., 56,706 man-hours.

No. 4 trap-rock quarry, Knippa, Uvalde County, Tex., operated by Southwest Stone Co., 55,515 man-hours.

Fredonia limestone quarry, Fredonia, Wilson County, Kans., operated by Consolidated Cement Corp., 53,694 man-hours.

Celina limestone quarry, Celina, Mercer County, Ohio, operated by The John W. Karch Stone Co., 51,441 man-hours.

Okay limestone quarry, Okay, Howard County, Ark., operated by Ideal Cement Co., 49,728 man-hours.

Dallas limestone quarry, Dallas, Dallas County, Tex., operated by Lone Star Cement Corp., 47,348 man-hours.

Earlham limestone quarry, Earlham, Madison County, Iowa, operated by Marquette Cement Manufacturing Co., 44,960 man-hours.

Evansville cement-rock quarry, Evansville, Berks County, Pa., operated by Allentown Portland Cement Co., 39,727 man-hours.

Winterset limestone quarry, Winterset, Madison County, Iowa, operated by Pennsylvania-Dixie Cement Corp., 37,827 man-hours.

Rochester limestone quarry, Rochester, Olmstead County, Minn., operated by Rochester State Hospital 35,520 man-hours.

Cloverbank shale quarry, Buffalo, Erie County, N. Y., operated by Lehigh Portland Cement Co., 35,048 man-hours.

Thomaston lime quarry, Thomaston, Knox County, Maine, operated by Lawrence Portland Cement Co., 31,160 man-hours.

1946

Indiana State Farm limestone quarry, Putnamville, Putnam County, Ind., operated by Indiana State Farm, 180,752 man-hours.

No. 5 limestone quarry, Hannibal, Ralls County, Mo., operated by Universal Atlas Cement Co., 160,828 man-hours.

Steelton limestone quarry, Steelton, Dauphin County, Pa., operated by Bethlehem Steel Co., 153,597 man-hours.

Naginey limestone quarry, Naginey, Mifflin County, Pa., operated by Bethlehem Steel Co., 149,074 man-hours.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., operated by Marquette Cement Manufacturing Co., 144,464 man-hours.

No. 4 cement-rock quarry, Nazareth, Northampton County, Pa., operated by Pennsylvania-Dixie Cement Co., 143,677 man-hours.

Fort Bellefontaine limestone quarry, St. Louis, St. Louis County, Mo., operated by Missouri Portland Cement Co., 142,680 man-hours.

Bethlehem limestone quarry, Bethlehem, Northampton County, Pa., operated by Bethlehem Steel Co., 137,093 man-hours.

St. Stephens limestone quarry, St. Stephens, Washington County, Ala., operated by Lone Star Cement Corp., 121,311 man-hours.

Northampton cement-rock quarry, Northampton, Northampton County, Pa., operated by Universal Atlas Cement Co., 114,050 man-hours.

LeRoy limestone quarry, LeRoy, Genesee County, N. Y., operated by The General Crushed Stone Co., 110,850 man-hours.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Co., 110,155 man-hours.

Nazareth cement-rock quarry, Nazareth, Northampton County, Pa., operated by Lone Star Cement Corp., 99,774 man-hours.

Dallas limestone quarry, Dallas, Dallas County, Tex., operated by Lone Star Cement Corp., 97,075 man-hours.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., operated by Lehigh Portland Cement Co., 92,405 man-hours.

Keeport limestone quarry, Logansport, Cass County, Ind., operated by The France Stone Co., 89,384 man-hours.

Lawrence limestone and shale quarry, Lawrence, Pontotoc County, Okla., operated by Ideal Cement Co., 88,704 man-hours.

Inwood limestone quarry, Inwood, Berkeley County, W. Va., operated by The J. E. Baker Co., 86,978 man-hours.

Sandt's Eddy cement-rock quarry, Martin's Creek, Northampton County, Pa., operated by Lehigh Portland Cement Co., 86,183 man-hours.

Catskill cement-rock quarry, Cementon, Greene County, N. Y., operated by Alpha Portland Cement Co., 83,834 man-hours.

Holland limestone quarry, Holland, Lucas County, Ohio, operated by The France Stone Co., 83,278 man-hours.

Catskill limestone quarry, Catskill, Greene County, N. Y., operated by North American Cement Corp., 82,747 man-hours.

La Salle Cement-rock quarry, La Salle, La Salle County, Ill., operated by Alpha Portland Cement Co., 82,500 man-hours.

Hercules cement-rock quarry, Stockertown, Northampton County, Pa., operated by Hercules Cement Corp., 80,822 man-hours.

Clinchfield No. 2 limestone quarry, Clinchfield, Houston County, Ga., operated by Pennsylvania-Dixie Cement Corp., 80,415 man-hours.

Bellevue limestone quarry, Bellevue, Sandusky County, Ohio, operated by The France Stone Co., 79,314 man-hours.

Blue Mount trap-rock quarry, Blue Mount, Baltimore County, Md., operated by The J. E. Baker Co., 79,055 man-hours.

Margerum limestone quarry, Margerum, Colbert County, Ala., operated by Alabama Asphaltic Limestone Co., 74,361 man-hours.

Permanente limestone quarry, Permanente, Santa Clara County, Calif., operated by Permanente Cement Co., 73,200 man-hours.

Rochester limestone quarry, Rochester, Olmsted County, Minn., operated by Rochester State Hospital, 71,168 man-hours.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by Marquette Cement Manufacturing Co., 70,098 man-hours.

Winchester trap-rock quarry, Winchester, Middlesex County, Mass., operated by The General Crushed Stone Co., 69,354 man-hours.

Lone Star limestone quarry, Hudson, Columbia County, N. Y., operated by Lone Star Cement Corp., 64,326 man-hours.

Middle Branch limestone quarry, Middle Branch, Stark County, Ohio, operated by The Diamond Portland Cement Co., 64,032 man-hours.

Eagle Ford limestone quarry, Eagle Ford, Dallas County, Tex., operated by Trinity Portland Cement Co., 59,142 man-hours.

Union Furnace limestone quarry, Tyrone, Huntingdon County, Pa., operated by Warner Co., 57,822 man-hours.

Plainville No. 4 trap-rock quarry, Plainville, Hartford County, Conn., operated by The New Haven Trap Rock Co., 57,690 man-hours.

Birmingham cement-rock quarry, Birmingham, Jefferson County, Ala., operated by Alpha Portland Cement Co., 54,865 man-hours.

Union Bridge limestone quarry, Union Bridge, Frederick & Carroll Counties, Md., operated by Lehigh Portland Cement Co., 53,486 man-hours.

National City gypsum quarry, National City, Iosco County, Mich., operated by National Gypsum Co., 52,876 man-hours.

Spring Grove limestone quarry, Spring Grove, Houston County, Minn., operated by Roverud Construction Co., 51,300 man-hours.

Middlefield No. 1 trap-rock quarry, Middlefield, New Haven County, Conn., operated by The New Haven Trap Rock Co., 49,822 man-hours.

Metaline Falls limestone and shale quarry, Metaline Falls, Pend Oreille County, Wash., operated by Lehigh Portland Cement Co., 48,986 man-hours.

No. 4 trap-rock quarry, Knippa, Uvalde County, Tex., operated by Southwest Stone Co., 46,497 man-hours.

St. Louis cement-rock quarry, Lemay, St. Louis County, Mo., operated by Alpha Portland Cement Co., 45,859 man-hours.

Bonner Springs limestone and shale quarry, Bonner Springs, Wyandotte County, Kans., operated by Lone Star Cement Corp., 45,390 man-hours.

Evansville cement-rock quarry, Evansville, Berks County, Pa., operated by Allentown Portland Cement Co., 41,851 man-hours.

Austin marble quarry, Llano, Llano County, Tex., operated by Dezendorf Marble Co., 41,600 man-hours.

Lewisburg limestone quarry, Lewisburg, Jefferson County, Ala., operated by Lone Star Cement Corp., 41,509 man-hours.

Winterset limestone quarry, Winterset, Madison County, Iowa, operated by Pennsylvania-Dixie Cement Corp., 39,826 man-hours.

Genoa limestone quarry, Genoa, Ottawa County, Ohio, operated by United States Gypsum Co., 37,776 man-hours.

Earlham limestone quarry, Earlham, Madison County, Iowa, operated by Marquette Cement Manufacturing Co., 32,136 man-hours.

Cloverbank shale quarry, Cloverbank, Erie County, N. Y., operated by Lehigh Portland Cement Co., 31,315 man-hours.

1945

Bessemer limestone quarry, Bessemer, Lawrence County, Pa., operated by Bessemer Limestone & Cement Co., 298,837 man-hours.

Billmeyer dolomite quarry, Bainbridge, Lancaster County, Pa., operated by The J. E. Baker Co., 234,822 man-hours.

Bethlehem limestone quarry, Bethlehem, Northampton County, Pa., operated by Bethlehem Steel Co., 166,214 man-hours.

Security limestone quarry, Hagerstown, Washington County, Md., operated by North American Cement Corp., 117,462 man-hours.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Co., 99,029 man-hours.

St. Stephens limestone quarry, Jackson, Washington County, Ala., operated by Lone Star Cement Corp., 97,959 man-hours.

Birmingham limestone quarry, Tarrant, Jefferson County, Ala., operated by Lehigh Portland Cement Co., 97,046 man-hours.

Hudson limestone quarry, Hudson, Columbia County, N. Y., operated by Universal Atlas Cement Co., 92,700 man-hours.

Walford limestone quarry, Hillsville, Lawrence County, Pa., operated by Lake Erie Limestone Co., 92,319 man-hours.

Martinsburg limestone quarry, Martinsburg, Berkeley County, W. Va., operated by North American Cement Corp., 90,877 man-hours.

Northampton cement-rock quarry, Northampton, Northampton County, Pa., operated by Universal Atlas Cement Co., 88,432 man-hours.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., operated by Marquette Cement Manufacturing Co., 84,480 man-hours.

Inwood limestone quarry, Inwood, Berkeley County, W. Va., operated by The J. E. Baker Co., 84,361 man-hours.

Fordwick Gay limestone and shale quarry, Fordwick, Augusta County, Va., operated by Lehigh Portland Cement Co., 83,855 man-hours.

Petoskey limestone quarry, Petoskey, Emmet County, Mich., operated by Petoskey Portland Cement Co., 77,669 man-hours.

Margerum limestone quarry, Margerum, Colbert County, Ala., operated by Alabama Asphaltic Limestone Co., 75,702 man-hours.

Fogelsville limestone-cement-rock quarry, Fogelsville, Lehigh County, Pa., operated by Lehigh Portland Cement Co., 75,658 man-hours.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by Marquette Cement Manufacturing Co., 70,792 man-hours.

Oglesby limestone quarry, Oglesby, La Salle County, Ill., operated by Lehigh Portland Cement Co., 69,333 man-hours.

Birmingham limestone quarry, Birmingham, Jefferson County, Ala., operated by Lone Star Cement Corp., 68,760 man-hours.

No. 3 cement-rock quarry, Coplay, Lehigh County, Pa., operated by Coplay Cement Manufacturing Co., 62,455 man-hours.

Blue Mount trap-rock quarry, White Hall, Baltimore County, Md., operated by The J. E. Baker Co., 61,848 man-hours

White Haven sandstone quarry, White Haven, Luzerne County, Pa., operated by The General Crushed Stone Co., 60,066 man-hours.

Iola limestone and shale quarry, Iola, Allen County, Kans., operated by Lehigh Portland Cement Co., 58,721 man-hours.

Ft. Bellefontaine limestone quarry, St. Louis, St. Louis County, Mo., operated by Missouri Portland Cement Co., 58,210 man-hours.

Martins Creek limestone quarry, Martins Creek, Northampton County, Pa., operated by Alpha Portland Cement Co., 57,204 man-hours.

Greencastle limestone quarry, Greencastle, Putnam County, Ind., operated by Lone Star Cement Corp., 55,583 man-hours.

Sylvania limestone quarry, Sylvania, Lucas County, Ohio, operated by Medusa Portland Cement Co., 54,199 man-hours.

Mason City limestone quarry, Mason City, Cerro Gordo County, Iowa, operated by Lehigh Portland Cement Co., 53,887 man-hours.

Catskill limestone quarry, Cementon, Greene County, N. Y., operated by Alpha Portland Cement Co., 53,487 man-hours.

Oro Grande limestone quarry, Oro Grande, San Bernardino County, Calif., operated by Riverside Cement Co., 51,552 man-hours.

Auburn limestone quarry, Auburn, Cayuga County, N. Y., operated by The General Crushed Stone Co., 47,970 man-hours.

Fort Worth limestone quarry, Fort Worth, Tarrant County, Tex., operated by Trinity Portland Cement Co., 46,228 man-hours.

Jordanville limestone quarry, Jordanville, Herkimer County, N. Y., operated by The General Crushed Stone Co., 44,872 man-hours.

Thomaston limestone quarry, Thomaston, Knox County, Me., operated by Lawrence Portland Cement Co., 44,747 man-hours.

Genoa limestone quarry, Genoa, Ottawa County, Ohio, operated by United States Gypsum Co., 44,480 man-hours.

Thomasville limestone quarry, Thomasville, York County, Pa., operated by The J. E. Baker Co., 42,714 man-hours.

Alsen limestone quarry, Alsen, Greene County, N. Y., operated by Lehigh Portland Cement Co., 42,667 man-hours.

Sandt's Eddy cement-rock quarry, Easton, Northampton County, Pa., operated by Lehigh Portland Cement Co., 40,572 man-hours.

Dallas limestone quarry, Dallas, Dallas County, Tex., operated by Lone Star Cement Corp., 40,449 man-hours.

Evansville cement-rock quarry, Evansville, Berks County, Pa., operated by Allentown Portland Cement Co., 40,063 man-hours.

Hercules cement-rock quarry, Stockertown, Northampton County, Pa., operated by Hercules Cement Corp., 38,440 man-hours.

No. 4 trap-rock quarry, Knippa, Uvalde County, Tex., operated by Southwest Stone Co., 37,836 man-hours.

Union Bridge limestone quarry, Union Bridge, Frederick & Carroll Counties, Md., operated by Lehigh Portland Cement Co., 36,353 man-hours.

Diamond limestone and shale quarry, Middle Branch, Stark County, Ohio, operated by The Diamond Portland Cement Co., 34,664 man-hours.

National City gypsum quarry, National City, Iosco County, Mich., operated by National Gypsum Co., 33,652 man-hours.

Folsom State granite quarry, Folsom, Sacramento County, Calif., operated by Folsom State Prison, 30,600 man-hours.

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Billmeyer dolomite quarry, Bainbridge, Lancaster County, Pa., operated by The J. E. Baker Co., 250,436 man-hours.

Walford limestone quarry, Hillsville, Lawrence County, Pa., operated by Lake Erie Limestone Co., 214,871 man-hours.

Bethlehem limestone quarry, Bethlehem, Northampton County, Pa., operated by Bethlehem Steel Co., 174,283 man-hours.

Steelton limestone quarry, Steelton, Dauphin County, Pa., operated by Bethlehem Steel Co., 156,989 man-hours.

Columbia cement quarry, East Fultonham, Muskingum County, Ohio, operated by Pittsburgh Plate Glass Co., 153,274 man-hours.

Folsom granite quarry, Represa, Sacramento County, Calif., operated by Folsom State Prison, 104,000 man-hours.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Co., 93,476 man-hours.

Genoa limestone quarry, Genoa, Ottawa County, Ohio, operated by United States Gypsum Co., 91,757 man-hours.

Birmingham limestone quarry, Tarrant, Jefferson County, Ala., operated by Lehigh Portland Cement Co., 87,087 man-hours.

St. Stephens limestone and shale quarry, St. Stephens, Washington County, Ala., operated by Lone Star Cement Corp., 86,384 man-hours.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by Marquette Cement Manufacturing Co., 84,374 man-hours.

Martinsburg limestone quarry, Martinsburg, Berkeley County, W. Va., operated by North American Cement Corp., 82,370 man-hours.

Fort Bellefontaine limestone quarry, St. Louis, St. Louis County, Mo., operated by Missouri Portland Cement Co., 79,856 man-hours.

Fordwick limestone and shale quarry, Fordwick, Augusta County, Va., operated by Lehigh Portland Cement Co., 78,419 man-hours.

White Haven sandstone quarry, White Haven, Luzerne County, Pa., operated by The General Crushed Stone Co., 62,922 man-hours.

Thomasville limestone quarry, Thomasville, York County, Pa., operated by The J. E. Baker Co., 59,305 man-hours.

Hudson limestone quarry, Hudson, Columbia County, N. Y., operated by Universal Atlas Cement Co., 57,979 man-hours.

Blue Mount trap-rock quarry, White Hall, Baltimore County, Md., operated by The J. E. Baker Co., 57,472 man-hours.

Union Furnace limestone quarry, Tyrone, Huntingdon County, Pa., operated by Warner Co., 55,319 man-hours.

Rochester limestone quarry, Rochester, Olmsted County, Minn., operated by Rochester State Hospital, 52,080 man-hours.

Nazareth No. 4 limestone-cement-rock quarry, Nazareth, Northampton County, Pa., operated by Nazareth Cement Co., 51,458 man-hours.

Martins Creek No. 4 cement-rock quarry, Martins Creek, Northampton County, Pa., operated by Alpha Portland Cement Co., 51,059 man-hours.

Mitchell limestone and shale quarry, Mitchell, Lawrence County, Ind., operated by Lehigh Portland Cement Co., 51,019 man-hours.

Clinchfield limestone quarry, Clinchfield, Houston County, Ga., operated by Pennsylvania-Dixie Cement Co., 50,792 man-hours.

Mason City limestone and clay quarry, Mason City, Cerro Gordo County, Iowa, operated by Lehigh Portland Cement Co., 49,863 man-hours.

No. 3 cement-rock quarry, Coplay, Lehigh County, Pa., operated by Coplay Cement Manufacturing Co., 49,680 man-hours.

Security limestone quarry, Hagerstown, Washington County, Md., operated by North American Cement Corp., 48,716 man-hours.

Iola limestone and shale quarry, Iola, Allen County, Kans., operated by Lehigh Portland Cement Co., 44,465 man-hours.

Greencastle limestone quarry, Greencastle, Putnam County, Ind., operated by Lone Star Cement Co., 44,436 man-hours.

No. 4 trap-rock quarry, Knippa, Uvalde County, Tex., operated by Southwest Stone Co., 43,698 man-hours.

Jordanville limestone quarry, Jordanville, Herkimer County, N. Y., operated by The General Crushed Stone Co., 43,047 man-hours.

Wet Weather limestone quarry, Riverside, Riverside County, Calif., operated by Riverside Cement Co., 41,514 man-hours.

Birmingham limestone quarry, Birmingham, Jefferson County, Ala., operated by Lone Star Cement Corp., 39,916 man-hours.

Celina limestone quarry, Celina, Mercer County, Ohio, operated by John W. Karch Stone Co., 39,110 man-hours.

McLeod limestone quarry, Williston, Levy County, Fla., operated by L. B. McLeod Construction Co., 36,615 man-hours.

Marcem limestone quarry, Gate City, Scott County, Va., operated by Pennsylvania-Dixie Cement Corp., 35,826 man-hours.

Catskill limestone quarry, Catskill, Greene County, N. Y., operated by North American Cement Corp., 33,760 man-hours.

National City gypsum quarry, National City, Iosco County, Mich., operated by National Gypsum Co., 33,456 man-hours.

Medusa limestone quarry, York, York County, Pa., operated by Medusa Portland Cement Co., 32,544 man-hours.

Evansville cement-rock quarry, Evansville, Berks County, Pa., operated by Allentown Portland Cement Co., 32,099 man-hours.

Fort Worth limestone quarry, Fort Worth, Tarrant County, Tex., operated by Trinity Portland Cement Co., 31,417 man-hours.

TABLE 11. - Injury experience of QUARRY GROUP in the National Safety Competition, 1925-47, by years

Year	Number of quarries	Man-hours	Number of injuries 1/					Number of days of disability 1/					Frequency rate 2/	Severity rate 2/
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1925	98	15,081,947	13	-	13	587	613	78,000	-	11,325	10,377	99,702	40.645	6.611
1926	112	18,972,189	15	3	14	600	632	90,000	18,000	17,550	12,720	138,270	33.312	7.288
1927	124	19,991,083	12	-	8	653	673	72,000	-	9,900	10,842	92,742	33.665	4.639
1928	122	18,825,578	13	-	10	500	523	78,000	-	12,600	9,847	100,447	27.781	5.336
1929	130	18,234,489	15	-	14	464	493	90,000	-	18,260	8,634	116,894	27.037	6.411
1930	148	18,375,872	9	-	16	411	436	54,000	-	14,500	7,121	75,621	23.727	4.115
1931	143	12,627,125	10	-	20	282	312	60,000	-	27,220	5,864	93,084	24.709	7.372
1932	119	8,027,833	3	-	13	120	136	18,000	-	13,881	3,718	35,599	16.941	4.434
1933	124	9,877,938	8	1	5	183	197	48,000	6,000	6,448	5,026	65,474	19.943	6.628
1934	133	11,150,006	5	-	9	190	204	30,000	-	6,245	3,484	39,729	18.296	3.563
1935	126	11,648,878	3	1	12	142	158	18,000	6,000	10,905	4,727	39,632	13.564	3.402
1936	130	15,506,593	10	1	19	286	316	60,000	6,000	20,768	7,607	94,375	20.378	6.086
1937	133	16,646,025	9	-	13	223	245	54,000	-	7,675	7,378	69,053	14.718	4.148
1938	144	14,251,530	7	-	9	172	188	42,000	-	12,150	6,435	60,585	13.192	4.251
1939	144	14,802,674	6	1	10	170	187	36,000	6,000	20,100	5,126	67,226	12.633	4.541
1940	143	13,641,735	6	1	10	165	182	36,000	6,000	8,340	5,884	56,224	13.341	4.121
1941	151	17,779,395	5	1	19	291	316	30,000	6,000	23,350	6,465	65,815	17.773	3.702
1942	3/146	20,834,788	5	2	15	435	457	30,000	12,000	13,215	12,146	67,361	21.934	3.233
1943	128	15,789,247	12	-	13	261	286	72,000	-	14,290	7,143	93,433	18.114	5.918
1944	115	11,637,025	8	-	10	205	223	48,000	-	10,950	5,834	64,784	19.163	5.567
1945	126	13,002,439	2	-	13	184	199	12,000	-	13,875	4,974	30,849	15.305	2.373
1946	142	16,933,926	2	-	18	300	320	12,000	-	13,391	7,816	33,207	18.897	1.961
1947	156	18,992,142	11	-	12	300	323	66,000	-	11,400	7,856	85,256	17.007	4.489
Total	-	352,630,457	189	11	295	7,124	7,619	1,134,000	66,000	318,338	167,024	1,685,362	21.606	4.779

1/ P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

2/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days lost from injuries per thousand man-hours.

3/ Omitting the entire record of 1 quarry, in which 28 lives were lost in a single disaster.

TABLE 12A. - Injury experience of each QUARRY enrolled in the National Safety Competition of 1947 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	297,246	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	288,806	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	222,332	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	176,614	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	141,615	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	139,890	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	130,979	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	126,642	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	126,157	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	122,656	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	116,068	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	114,351	-	-	-	-	-	-	-	-	-	-	-	.000	.000
13	111,628	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	106,282	-	-	-	-	-	-	-	-	-	-	-	.000	.000
15	105,129	-	-	-	-	-	-	-	-	-	-	-	.000	.000
16	104,896	-	-	-	-	-	-	-	-	-	-	-	.000	.000
17	100,518	-	-	-	-	-	-	-	-	-	-	-	.000	.000
18	96,401	-	-	-	-	-	-	-	-	-	-	-	.000	.000
19	94,799	-	-	-	-	-	-	-	-	-	-	-	.000	.000
20	94,646	-	-	-	-	-	-	-	-	-	-	-	.000	.000
21	93,869	-	-	-	-	-	-	-	-	-	-	-	.000	.000
22	91,014	-	-	-	-	-	-	-	-	-	-	-	.000	.000
23	90,616	-	-	-	-	-	-	-	-	-	-	-	.000	.000
24	89,856	-	-	-	-	-	-	-	-	-	-	-	.000	.000
25	86,460	-	-	-	-	-	-	-	-	-	-	-	.000	.000
26	85,914	-	-	-	-	-	-	-	-	-	-	-	.000	.000
27	83,533	-	-	-	-	-	-	-	-	-	-	-	.000	.000
28	83,132	-	-	-	-	-	-	-	-	-	-	-	.000	.000
29	82,684	-	-	-	-	-	-	-	-	-	-	-	.000	.000
30	81,912	-	-	-	-	-	-	-	-	-	-	-	.000	.000
31	81,400	-	-	-	-	-	-	-	-	-	-	-	.000	.000
32	81,249	-	-	-	-	-	-	-	-	-	-	-	.000	.000
33	80,020	-	-	-	-	-	-	-	-	-	-	-	.000	.000
34	77,736	-	-	-	-	-	-	-	-	-	-	-	.000	.000
35	76,323	-	-	-	-	-	-	-	-	-	-	-	.000	.000
36	75,717	-	-	-	-	-	-	-	-	-	-	-	.000	.000
37	74,634	-	-	-	-	-	-	-	-	-	-	-	.000	.000
38	74,187	-	-	-	-	-	-	-	-	-	-	-	.000	.000
39	71,712	-	-	-	-	-	-	-	-	-	-	-	.000	.000
40	71,391	-	-	-	-	-	-	-	-	-	-	-	.000	.000
41	69,036	-	-	-	-	-	-	-	-	-	-	-	.000	.000
42	68,667	-	-	-	-	-	-	-	-	-	-	-	.000	.000
43	66,918	-	-	-	-	-	-	-	-	-	-	-	.000	.000
44	65,568	-	-	-	-	-	-	-	-	-	-	-	.000	.000
45	65,338	-	-	-	-	-	-	-	-	-	-	-	.000	.000
46	64,576	-	-	-	-	-	-	-	-	-	-	-	.000	.000
47	64,001	-	-	-	-	-	-	-	-	-	-	-	.000	.000
48	63,622	-	-	-	-	-	-	-	-	-	-	-	.000	.000
49	62,928	-	-	-	-	-	-	-	-	-	-	-	.000	.000
50	59,002	-	-	-	-	-	-	-	-	-	-	-	.000	.000
51	58,280	-	-	-	-	-	-	-	-	-	-	-	.000	.000
52	57,755	-	-	-	-	-	-	-	-	-	-	-	.000	.000
53	56,706	-	-	-	-	-	-	-	-	-	-	-	.000	.000
54	55,515	-	-	-	-	-	-	-	-	-	-	-	.000	.000
55	53,694	-	-	-	-	-	-	-	-	-	-	-	.000	.000
56	51,441	-	-	-	-	-	-	-	-	-	-	-	.000	.000
57	49,728	-	-	-	-	-	-	-	-	-	-	-	.000	.000
58	47,348	-	-	-	-	-	-	-	-	-	-	-	.000	.000
59	44,960	-	-	-	-	-	-	-	-	-	-	-	.000	.000
60	39,727	-	-	-	-	-	-	-	-	-	-	-	.000	.000
61	37,827	-	-	-	-	-	-	-	-	-	-	-	.000	.000
62	35,520	-	-	-	-	-	-	-	-	-	-	-	.000	.000
63	35,048	-	-	-	-	-	-	-	-	-	-	-	.000	.000
64	31,160	-	-	-	-	-	-	-	-	-	-	-	.000	.000
65	28,436	-	-	-	-	-	-	-	-	-	-	-	.000	.000
66	27,439	-	-	-	-	-	-	-	-	-	-	-	.000	.000
67	25,001	-	-	-	-	-	-	-	-	-	-	-	.000	.000
68	25,000	-	-	-	-	-	-	-	-	-	-	-	.000	.000
69	23,840	-	-	-	-	-	-	-	-	-	-	-	.000	.000
70	22,400	-	-	-	-	-	-	-	-	-	-	-	.000	.000
71	21,775	-	-	-	-	-	-	-	-	-	-	-	.000	.000
72	21,122	-	-	-	-	-	-	-	-	-	-	-	.000	.000
73	14,560	-	-	-	-	-	-	-	-	-	-	-	.000	.000
74	12,814	-	-	-	-	-	-	-	-	-	-	-	.000	.000
75	421,609	-	-	-	1	1	4	-	-	-	4	4	2.372	.009
76	108,647	-	-	-	1	1	1	-	-	-	1	1	9.204	.009
77	47,025	-	-	-	1	1	1	-	-	-	1	1	21.265	.021
78	26,400	-	-	-	1	1	1	-	-	-	1	1	37.879	.038

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TABLE 12A. - Injury experience of each QUARRY enrolled in the National Safety Competition of 1947 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries					Average days of disability per temp. injury	Number of days of disability					Frequency rate	Severity rate
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
79	175,043	-	-	-	1	1	8	-	-	-	8	8	5.713	.046
80	122,077	-	-	-	1	1	7	-	-	-	7	7	8.192	.057
81	69,943	-	-	-	2	2	2	-	-	-	4	4	28.595	.057
82	98,250	-	-	-	1	1	6	-	-	-	6	6	10.178	.061
83	110,592	-	-	-	2	2	5	-	-	-	9	9	18.084	.081
84	117,161	-	-	-	1	1	10	-	-	-	10	10	8.535	.085
85	101,439	-	-	-	1	1	11	-	-	-	11	11	9.858	.108
86	179,685	-	-	-	2	2	10	-	-	-	20	20	11.131	.111
87	157,094	-	-	-	2	2	11	-	-	-	22	22	12.731	.140
88	77,009	-	-	-	1	1	11	-	-	-	11	11	12.985	.143
89	92,968	-	-	-	2	2	8	-	-	-	15	15	21.513	.161
90	43,200	-	-	-	1	1	7	-	-	-	7	7	23.148	.162
91	94,426	-	-	-	1	1	18	-	-	-	18	18	10.590	.191
92	670,808	-	-	-	5	5	29	-	-	-	146	146	7.454	.218
93	91,611	-	-	-	5	5	4	-	-	-	20	20	54.579	.218
94	75,257	-	-	-	3	3	6	-	-	-	17	17	39.863	.226
95	201,846	-	-	-	1	1	59	-	-	-	59	59	4.954	.292
96	102,678	-	-	-	3	3	10	-	-	-	30	30	29.218	.292
97	130.645	-	-	-	3	3	14	-	-	-	42	42	22.963	.321
98	101,884	-	-	-	1	1	33	-	-	-	33	33	9.815	.324
99	329,080	-	-	-	6	6	18	-	-	-	110	110	18.233	.334
100	176,134	-	-	-	3	3	23	-	-	-	68	68	17.032	.386
101	133,995	-	-	-	2	2	27	-	-	-	53	53	14.926	.396
102	35,392	-	-	-	1	1	14	-	-	-	14	14	28.255	.396
103	55,627	-	-	-	1	1	23	-	-	-	23	23	17.977	.413
104	136,021	-	-	-	1	1	57	-	-	-	57	57	7.352	.419
105	90,250	-	-	-	3	3	14	-	-	-	41	41	33.241	.454
106	48,102	-	-	-	2	2	11	-	-	-	22	22	41.578	.457
107	207,846	-	-	-	4	4	25	-	-	-	101	101	19.245	.486
108	85,496	-	-	-	1	1	43	-	-	-	43	43	11.696	.503
109	588,166	-	-	-	19	19	16	-	-	-	299	299	32.304	.508
110	187,139	-	-	-	5	5	20	-	-	-	102	102	26.718	.545
111	69,396	-	-	-	2	2	21	-	-	-	42	42	28.820	.605
112	42,255	-	-	-	1	1	28	-	-	-	28	28	23.666	.663
113	185,609	-	-	-	4	4	34	-	-	-	135	135	21.551	.727
114	49,642	-	-	-	2	2	19	-	-	-	37	37	40.288	.745
115	76,015	-	-	-	3	3	19	-	-	-	57	57	39.466	.750
116	218,877	-	-	-	7	7	24	-	-	-	165	165	31.981	.754
117	113,704	-	-	-	5	5	18	-	-	-	92	92	43.974	.809
118	30,816	-	-	-	2	2	13	-	-	-	26	26	64.901	.844
119	227,801	-	-	-	14	14	16	-	-	-	223	223	61.457	.979
120	53,196	-	-	-	1	1	56	-	-	-	56	56	18.798	1.053
121	27,785	-	-	-	3	3	11	-	-	-	33	33	107.972	1.188
122	295,262	-	-	1	4	5	17	-	-	300	66	366	16.934	1.240
123	54,792	-	-	-	2	2	38	-	-	-	76	76	36.502	1.387
124	105,586	-	-	-	8	8	19	-	-	-	154	154	75.768	1.459
125	181,962	-	-	-	9	9	30	-	-	-	267	267	49.461	1.467
126	228,827	-	-	1	13	14	15	-	-	150	191	341	61.182	1.490
127	194,617	-	-	-	5	5	62	-	-	-	311	311	25.691	1.598
128	301,851	-	-	1	17	18	18	-	-	300	313	613	59.632	2.031
129	125,793	-	-	1	1	2	7	-	-	300	7	307	15.899	2.441
130	122,130	-	-	-	15	15	22	-	-	-	325	325	122.820	2.661
131	276,597	-	-	-	17	17	45	-	-	-	770	770	61.461	2.784
132	53,520	-	-	-	4	4	38	-	-	-	151	151	74.738	2.821
133	34,182	-	-	-	1	1	103	-	-	-	103	103	29.255	3.013
134	114,625	-	-	1	4	5	34	-	-	225	135	360	43.621	3.141
135	25,476	-	-	-	3	3	28	-	-	-	85	85	117.758	3.336
136	206,441	-	-	-	8	8	90	-	-	-	723	723	38.752	3.502
137	94,552	-	-	-	1	1	348	-	-	-	348	348	10.576	3.681
138	37,600	-	-	-	8	8	17	-	-	-	139	139	212.766	3.697
139	53,187	-	-	-	1	1	241	-	-	-	241	241	18.802	4.531
140	1,194,435	1	-	-	1	2	21	6,000	-	-	21	6,021	1.674	5.041
141	351,579	-	-	1	-	1	-	-	-	1,800	-	1,800	2.844	5.120
142	109,540	-	-	1	-	1	-	-	-	750	-	750	9.129	6.847
143	57,656	-	-	1	1	2	115	-	-	300	115	415	34.688	7.198
144	293,037	-	-	1	9	10	25	-	-	2,400	229	2,629	34.125	8.972
145	46,926	-	-	1	1	2	13	-	-	450	13	463	42.620	9.867
146	401,493	1	-	-	-	1	-	6,000	-	-	-	6,000	2.491	14.944
147	323,264	1	-	-	3	4	14	6,000	-	-	42	6,042	12.374	18.691
148	209,664	1	-	-	1	2	73	6,000	-	-	73	6,073	9.539	28.965
149	132,577	-	-	1	5	6	8	-	-	3,825	40	3,865	45.257	29.153
150	178,885	1	-	-	3	4	100	6,000	-	-	301	6,301	22.361	35.224
151	159,774	1	-	1	14	16	10	6,000	-	600	145	6,745	100.141	42.216
152	123,539	1	-	-	1	2	7	6,000	-	-	7	6,007	16.189	48.624
153	120,170	1	-	-	2	3	50	6,000	-	-	100	6,100	24.965	50.761
154	86,825	1	-	-	2	3	3	6,000	-	-	6	6,006	34.552	69.174
155	74,413	1	-	-	-	1	-	6,000	-	-	-	6,000	13.439	80.631
156	57,958	1	-	-	1	2	30	6,000	-	-	30	6,030	34.508	104.041
Totals and averages 1947	18,992,142	11	-	12	300	323	26	66,000	-	11,400	7,856	85,256	17.007	4.489
1946	16,933,926	2	-	18	300	320	26	12,000	-	13,391	7,816	33,207	18.897	1.961

1/ As reports from mining companies are considered confidental by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

TABLE 12B. - Injury experience of each Quarry enrolled in the National Safety Competition of 1946 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	322,374	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	180,752	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	160,828	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	153,597	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	149,074	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	144,464	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	143,677	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	142,680	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	137,093	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	121,311	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	114,050	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	110,850	-	-	-	-	-	-	-	-	-	-	-	.000	.000
13	110,155	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	99,774	-	-	-	-	-	-	-	-	-	-	-	.000	.000
15	97,075	-	-	-	-	-	-	-	-	-	-	-	.000	.000
16	92,405	-	-	-	-	-	-	-	-	-	-	-	.000	.000
17	89,384	-	-	-	-	-	-	-	-	-	-	-	.000	.000
18	88,704	-	-	-	-	-	-	-	-	-	-	-	.000	.000
19	86,978	-	-	-	-	-	-	-	-	-	-	-	.000	.000
20	86,183	-	-	-	-	-	-	-	-	-	-	-	.000	.000
21	83,834	-	-	-	-	-	-	-	-	-	-	-	.000	.000
22	83,278	-	-	-	-	-	-	-	-	-	-	-	.000	.000
23	82,747	-	-	-	-	-	-	-	-	-	-	-	.000	.000
24	82,500	-	-	-	-	-	-	-	-	-	-	-	.000	.000
25	80,822	-	-	-	-	-	-	-	-	-	-	-	.000	.000
26	80,415	-	-	-	-	-	-	-	-	-	-	-	.000	.000
27	79,314	-	-	-	-	-	-	-	-	-	-	-	.000	.000
28	79,055	-	-	-	-	-	-	-	-	-	-	-	.000	.000
29	74,361	-	-	-	-	-	-	-	-	-	-	-	.000	.000
30	73,200	-	-	-	-	-	-	-	-	-	-	-	.000	.000
31	71,168	-	-	-	-	-	-	-	-	-	-	-	.000	.000
32	70,098	-	-	-	-	-	-	-	-	-	-	-	.000	.000
33	69,354	-	-	-	-	-	-	-	-	-	-	-	.000	.000
34	64,326	-	-	-	-	-	-	-	-	-	-	-	.000	.000
35	64,032	-	-	-	-	-	-	-	-	-	-	-	.000	.000
36	59,142	-	-	-	-	-	-	-	-	-	-	-	.000	.000
37	57,822	-	-	-	-	-	-	-	-	-	-	-	.000	.000
38	57,690	-	-	-	-	-	-	-	-	-	-	-	.000	.000
39	54,865	-	-	-	-	-	-	-	-	-	-	-	.000	.000
40	53,486	-	-	-	-	-	-	-	-	-	-	-	.000	.000
41	52,876	-	-	-	-	-	-	-	-	-	-	-	.000	.000
42	51,300	-	-	-	-	-	-	-	-	-	-	-	.000	.000
43	49,822	-	-	-	-	-	-	-	-	-	-	-	.000	.000
44	48,986	-	-	-	-	-	-	-	-	-	-	-	.000	.000
45	46,497	-	-	-	-	-	-	-	-	-	-	-	.000	.000
46	45,859	-	-	-	-	-	-	-	-	-	-	-	.000	.000
47	45,390	-	-	-	-	-	-	-	-	-	-	-	.000	.000
48	41,851	-	-	-	-	-	-	-	-	-	-	-	.000	.000
49	41,600	-	-	-	-	-	-	-	-	-	-	-	.000	.000
50	41,509	-	-	-	-	-	-	-	-	-	-	-	.000	.000
51	39,826	-	-	-	-	-	-	-	-	-	-	-	.000	.000
52	37,776	-	-	-	-	-	-	-	-	-	-	-	.000	.000
53	32,136	-	-	-	-	-	-	-	-	-	-	-	.000	.000
54	31,315	-	-	-	-	-	-	-	-	-	-	-	.000	.000
55	29,472	-	-	-	-	-	-	-	-	-	-	-	.000	.000
56	29,310	-	-	-	-	-	-	-	-	-	-	-	.000	.000
57	28,896	-	-	-	-	-	-	-	-	-	-	-	.000	.000
58	28,350	-	-	-	-	-	-	-	-	-	-	-	.000	.000
59	24,960	-	-	-	-	-	-	-	-	-	-	-	.000	.000
60	14,440	-	-	-	-	-	-	-	-	-	-	-	.000	.000
61	230,552	-	-	-	4	4	3	-	-	-	10	10	17.350	.043
62	136,234	-	-	-	2	2	3	-	-	-	6	6	14.681	.044
63	305,638	-	-	-	1	1	15	-	-	-	15	15	3.272	.049
64	69,317	-	-	-	1	1	4	-	-	-	4	4	14.426	.058
65	157,976	-	-	-	5	5	5	-	-	-	26	26	31.650	.165
66	118,576	-	-	-	1	1	20	-	-	-	20	20	8.433	.169
67	160,537	-	-	-	3	3	10	-	-	-	29	29	18.687	.181
68	121,233	-	-	-	3	3	8	-	-	-	23	23	24.746	.190
69	259,969	-	-	-	1	1	57	-	-	-	57	57	3.847	.219
70	235,961	-	-	-	1	1	55	-	-	-	55	55	4.238	.233
71	1,107,984	-	-	1	2	3	57	-	-	150	113	263	2.708	.237
72	169,725	-	-	-	3	3	14	-	-	-	42	42	17.676	.247
73	455,452	-	-	-	6	6	20	-	-	-	120	120	13.174	.263
74	111,639	-	-	-	1	1	30	-	-	-	30	30	8.957	.269
75	198,755	-	-	-	1	1	63	-	-	-	63	63	5.031	.317
76	124,175	-	-	-	1	1	40	-	-	-	40	40	8.053	.322
77	124,082	-	-	-	1	1	41	-	-	-	41	41	8.059	.330
78	206,913	-	-	-	8	8	9	-	-	-	70	70	38.664	.338
79	56,985	-	-	-	2	2	10	-	-	-	20	20	35.097	.351

TABLE 12B. - Injury experience of each QUARRY enrolled in the National Safety Competition of 1946 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
80	33,588	-	-	-	1	1	12	-	-	-	12	12	29.773	0.357
81	85,600	-	-	-	8	8	4	-	-	-	31	31	93.458	.362
82	87,735	-	-	-	1	1	34	-	-	-	34	34	11.398	.388
83	109,729	-	-	-	1	1	45	-	-	-	45	45	9.113	.410
84	107,780	-	-	-	3	3	15	-	-	-	46	46	27.834	.427
85	82,434	-	-	-	5	5	7	-	-	-	36	36	60.655	.437
86	68,120	-	-	-	3	3	10	-	-	-	31	31	44.040	.455
87	86,559	-	-	-	1	1	41	-	-	-	41	41	11.553	.474
88	309,150	-	-	-	10	10	16	-	-	-	159	159	32.347	.514
89	120,640	-	-	-	4	4	16	-	-	-	62	62	33.156	.514
90	94,440	-	-	-	1	1	49	-	-	-	49	49	10.589	.519
91	57,971	-	-	-	4	4	8	-	-	-	31	31	69.000	.535
92	57,189	-	-	-	5	5	6	-	-	-	32	32	87.429	.560
93	96,334	-	-	-	2	2	28	-	-	-	55	55	20.761	.571
94	77,006	-	-	-	2	2	23	-	-	-	45	45	25.972	.584
95	103,018	-	-	-	2	2	31	-	-	-	61	61	19.414	.592
96	41,752	-	-	-	1	1	25	-	-	-	25	25	23.951	.599
97	72,853	-	-	-	2	2	23	-	-	-	45	45	27.453	.618
98	214,902	-	-	-	6	6	22	-	-	-	134	134	27.920	.624
99	342,024	-	-	-	11	11	20	-	-	-	223	223	32.161	.652
100	82,284	-	-	-	3	3	18	-	-	-	54	54	36.459	.656
101	85,525	-	-	-	1	1	60	-	-	-	60	60	11.692	.702
102	478,489	-	-	-	16	16	21	-	-	-	338	338	33.439	.706
103	33,170	-	-	-	1	1	24	-	-	-	24	24	30.148	.724
104	163,144	-	-	-	9	9	14	-	-	-	126	126	55.166	.772
105	85,395	-	-	-	5	5	14	-	-	-	68	68	58.551	.796
106	148,902	-	-	-	3	3	40	-	-	-	121	121	20.147	.813
107	546,210	-	-	1	12	13	36	-	-	75	429	504	23.800	.923
108	41,125	-	-	-	1	1	38	-	-	-	38	38	24.316	.924
109	41,877	-	-	-	3	3	13	-	-	-	39	39	71.638	.931
110	87,365	-	-	-	3	3	27	-	-	-	82	82	34.339	.939
111	200,330	-	-	1	3	4	14	-	-	150	41	191	19.967	.953
112	16,176	-	-	-	4	4	4	-	-	-	16	16	247.280	.989
113	125,793	-	-	-	4	4	32	-	-	-	127	127	31.798	1.010
114	250,583	-	-	-	7	7	43	-	-	-	298	298	27.933	1.189
115	187,004	-	-	1	2	3	75	-	-	75	150	225	16.042	1.203
116	48,951	-	-	-	1	1	59	-	-	-	59	59	20.429	1.205
117	67,065	-	-	1	1	2	16	-	-	75	16	91	29.822	1.357
118	234,789	-	-	-	11	11	30	-	-	-	326	326	46.851	1.388
119	377,128	-	-	1	6	7	39	-	-	300	234	534	18.561	1.416
120	92,516	-	-	-	3	3	44	-	-	-	131	131	32.427	1.416
121	101,075	-	-	1	1	2	12	-	-	150	12	162	19.787	1.603
122	61,837	-	-	-	1	1	105	-	-	-	105	105	16.172	1.698
123	45,387	-	-	-	7	7	11	-	-	-	79	79	154.229	1.741
124	23,940	-	-	-	4	4	11	-	-	-	42	42	167.084	1.754
125	85,120	-	-	-	2	2	75	-	-	-	150	150	23.496	1.762
126	53,133	-	-	-	1	1	113	-	-	-	113	113	18.821	2.127
127	54,308	-	-	1	-	1	-	-	-	150	-	150	18.413	2.762
128	66,212	-	-	-	1	1	213	-	-	-	213	213	15.103	3.217
129	15,240	-	-	-	5	5	10	-	-	-	51	51	328.084	3.346
130	262,080	-	-	1	13	14	35	-	-	450	449	899	53.419	3.430
131	121,677	-	-	1	1	2	132	-	-	300	132	432	16.437	3.550
132	314,869	-	-	1	32	33	28	-	-	266	889	1,155	104.805	3.668
133	95,360	-	-	1	-	1	-	-	-	600	-	600	10.487	6.292
134	213,600	-	-	1	3	4	7	-	-	1,800	22	1,822	18.727	8.530
135	49,448	-	-	1	-	1	-	-	-	600	-	600	20.223	12.134
136	20,618	-	-	-	1	1	306	-	-	-	306	306	48.501	14.841
137	159,408	-	-	1	3	4	14	-	-	2,400	43	2,443	25.093	15.325
138	133,042	-	-	1	2	3	189	-	-	2,250	378	2,628	22.549	19.753
139	25,164	-	-	1	-	1	-	-	-	600	-	600	39.739	23.844
140	60,416	-	-	1	-	1	-	-	-	3,000	-	3,000	16.552	49.656
141	100,640	1	-	-	4	5	19	6,000	-	-	74	6,074	49.682	60.354
142	61,916	1	-	-	-	1	-	6,000	-	-	-	6,000	16.151	96.905
Totals and averages 1946	16,933,926	2	-	18	300	320	26	12,000	-	13,391	7,816	33,207	18.897	1.961
1945	13,002,439	2	-	13	184	199	27	12,000	-	13,875	4,974	30,849	15.305	2.373

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F. Fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

TABLE 120. - Injury experience of each QUARRY enrolled in the National Safety Competition of 1945 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	379,948	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	298,837	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	234,822	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	166,214	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	117,462	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	99,029	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	97,959	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	97,046	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	92,700	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	92,319	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	90,877	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	88,432	-	-	-	-	-	-	-	-	-	-	-	.000	.000
13	84,480	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	84,361	-	-	-	-	-	-	-	-	-	-	-	.000	.000
15	83,855	-	-	-	-	-	-	-	-	-	-	-	.000	.000
16	77,669	-	-	-	-	-	-	-	-	-	-	-	.000	.000
17	75,702	-	-	-	-	-	-	-	-	-	-	-	.000	.000
18	75,658	-	-	-	-	-	-	-	-	-	-	-	.000	.000
19	70,792	-	-	-	-	-	-	-	-	-	-	-	.000	.000
20	69,333	-	-	-	-	-	-	-	-	-	-	-	.000	.000
21	68,760	-	-	-	-	-	-	-	-	-	-	-	.000	.000
22	62,455	-	-	-	-	-	-	-	-	-	-	-	.000	.000
23	61,848	-	-	-	-	-	-	-	-	-	-	-	.000	.000
24	60,066	-	-	-	-	-	-	-	-	-	-	-	.000	.000
25	58,721	-	-	-	-	-	-	-	-	-	-	-	.000	.000
26	58,210	-	-	-	-	-	-	-	-	-	-	-	.000	.000
27	57,204	-	-	-	-	-	-	-	-	-	-	-	.000	.000
28	55,583	-	-	-	-	-	-	-	-	-	-	-	.000	.000
29	54,199	-	-	-	-	-	-	-	-	-	-	-	.000	.000
30	53,887	-	-	-	-	-	-	-	-	-	-	-	.000	.000
31	53,487	-	-	-	-	-	-	-	-	-	-	-	.000	.000
32	51,552	-	-	-	-	-	-	-	-	-	-	-	.000	.000
33	47,970	-	-	-	-	-	-	-	-	-	-	-	.000	.000
34	46,228	-	-	-	-	-	-	-	-	-	-	-	.000	.000
35	44,872	-	-	-	-	-	-	-	-	-	-	-	.000	.000
36	44,747	-	-	-	-	-	-	-	-	-	-	-	.000	.000
37	44,480	-	-	-	-	-	-	-	-	-	-	-	.000	.000
38	42,714	-	-	-	-	-	-	-	-	-	-	-	.000	.000
39	42,667	-	-	-	-	-	-	-	-	-	-	-	.000	.000
40	40,572	-	-	-	-	-	-	-	-	-	-	-	.000	.000
41	40,449	-	-	-	-	-	-	-	-	-	-	-	.000	.000
42	40,063	-	-	-	-	-	-	-	-	-	-	-	.000	.000
43	38,440	-	-	-	-	-	-	-	-	-	-	-	.000	.000
44	37,836	-	-	-	-	-	-	-	-	-	-	-	.000	.000
45	36,353	-	-	-	-	-	-	-	-	-	-	-	.000	.000
46	34,664	-	-	-	-	-	-	-	-	-	-	-	.000	.000
47	33,652	-	-	-	-	-	-	-	-	-	-	-	.000	.000
48	30,600	-	-	-	-	-	-	-	-	-	-	-	.000	.000
49	29,540	-	-	-	-	-	-	-	-	-	-	-	.000	.000
50	29,344	-	-	-	-	-	-	-	-	-	-	-	.000	.000
51	28,787	-	-	-	-	-	-	-	-	-	-	-	.000	.000
52	28,557	-	-	-	-	-	-	-	-	-	-	-	.000	.000
53	27,329	-	-	-	-	-	-	-	-	-	-	-	.000	.000
54	27,026	-	-	-	-	-	-	-	-	-	-	-	.000	.000
55	25,086	-	-	-	-	-	-	-	-	-	-	-	.000	.000
56	24,788	-	-	-	-	-	-	-	-	-	-	-	.000	.000
57	20,566	-	-	-	-	-	-	-	-	-	-	-	.000	.000
58	19,656	-	-	-	-	-	-	-	-	-	-	-	.000	.000
59	16,794	-	-	-	-	-	-	-	-	-	-	-	.000	.000
60	16,727	-	-	-	-	-	-	-	-	-	-	-	.000	.000
61	13,640	-	-	-	-	-	-	-	-	-	-	-	.000	.000
62	10,223	-	-	-	-	-	-	-	-	-	-	-	.000	.000
63	86,314	-	-	-	1	1	1	-	-	-	1	1	11.586	.012
64	34,632	-	-	-	1	1	1	-	-	-	1	1	28.875	.029
65	63,907	-	-	-	1	1	2	-	-	-	2	2	15.648	.031
66	149,546	-	-	-	1	1	5	-	-	-	5	5	6.687	.333
67	139,000	-	-	-	1	1	6	-	-	-	6	6	7.194	.043
68	115,448	-	-	-	1	1	6	-	-	-	6	6	8.662	.052
69	311,796	-	-	-	2	2	11	-	-	-	21	21	6.414	.067
70	46,665	-	-	-	1	1	4	-	-	-	4	4	21.429	.086
71	128,617	-	-	-	2	1	6	-	-	-	12	12	15.550	.093
72	341,850	-	-	-	1	1	37	-	-	-	37	37	2.925	.108
73	72,600	-	-	-	2	2	4	-	-	-	8	8	27.548	.110
74	42,325	-	-	-	1	1	5	-	-	-	5	5	23.627	.118

TABLE 12C. - Injury experience of each QUARRY enrolled in the National Safety Competition of 1945 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
75	28,896	-	-	-	1	1	4	-	-	-	4	4	34.607	0.138
76	74,073	-	-	-	1	1	13	-	-	-	13	13	13.500	.176
77	40,848	-	-	-	2	2	4	-	-	-	8	8	48.962	.196
78	102,648	-	-	-	4	4	6	-	-	-	22	22	38.968	.214
79	70,385	-	-	-	2	2	8	-	-	-	16	16	28.415	.227
80	145,830	-	-	-	2	2	20	-	-	-	39	39	13.715	.267
81	40,137	-	-	-	2	2	6	-	-	-	11	11	49.829	.274
82	99,960	-	-	-	4	4	7	-	-	-	28	28	40.016	.280
83	114,978	-	-	-	4	4	8	-	-	-	33	33	34.789	.287
84	170,787	-	-	-	1	1	57	-	-	-	57	57	5.855	.334
85	67,714	-	-	-	2	2	12	-	-	-	24	24	29.536	.354
86	369,750	-	-	-	2	2	72	-	-	-	143	143	5.409	.387
87	208,601	-	-	-	7	7	12	-	-	-	86	86	33.557	.412
88	56,350	-	-	-	1	1	24	-	-	-	24	24	17.746	.426
89	22,848	-	-	-	2	2	5	-	-	-	10	10	87.535	.438
90	268,834	-	-	-	2	2	61	-	-	-	122	122	7.440	.454
91	56,512	-	-	-	1	1	26	-	-	-	26	26	17.695	.460
92	210,750	-	-	-	8	8	13	-	-	-	101	101	37.960	.479
93	56,672	-	-	-	1	1	29	-	-	-	29	29	17.645	.512
94	84,210	-	-	-	2	2	24	-	-	-	47	47	23.750	.558
95	196,882	-	-	-	4	4	28	-	-	-	111	111	20.317	.564
96	170,067	-	-	-	7	7	15	-	-	-	102	102	41.160	.600
97	98,310	-	-	-	1	1	61	-	-	-	61	61	10.173	.620
98	73,314	-	-	-	1	1	49	-	-	-	49	49	13.640	.668
99	105,022	-	-	-	4	4	20	-	-	-	81	81	38.087	.771
100	88,600	-	-	-	2	2	36	-	-	-	72	72	22.573	.813
101	642,331	-	-	-	11	11	49	-	-	-	543	543	17.125	.845
102	25,200	-	-	-	1	1	24	-	-	-	24	24	39.683	.952
103	73,485	-	-	-	4	4	18	-	-	-	72	72	54.433	.980
104	49,569	-	-	-	1	1	59	-	-	-	59	59	20.174	1.190
105	233,343	-	-	-	17	17	17	-	-	-	281	281	72.854	1.204
106	40,226	-	-	-	1	1	57	-	-	-	57	57	24.860	1.417
107	181,863	-	-	-	11	11	24	-	-	-	261	261	60.485	1.435
108	99,811	-	-	-	4	4	45	-	-	-	178	178	40.076	1.783
109	41,399	-	-	-	1	1	83	-	-	-	83	83	24.155	2.005
110	45,504	-	-	-	2	2	49	-	-	-	97	97	43.952	2.132
111	177,401	-	-	-	8	8	49	-	-	-	394	394	45.096	2.221
112	47,457	-	-	-	2	2	60	-	-	-	120	120	42.143	2.529
113	65,210	-	-	-	1	1	183	-	-	-	183	183	15.335	2.806
114	490,796	-	-	1	19	20	34	-	-	750	645	1,395	40.750	2.842
115	20,322	-	-	-	1	1	58	-	-	-	58	58	49.208	2.854
116	60,864	-	-	1	-	1	-	-	-	300	-	300	16.430	4.929
117	60,107	-	-	1	2	3	3	-	-	300	5	305	49.911	5.074
118	205,960	-	-	1	-	1	-	-	-	1,200	-	1,200	4.855	5.826
119	1,036,479	1	-	1	2	4	36	6,000	-	300	71	6,371	3.859	6.147
120	128,598	-	-	1	3	4	16	-	-	750	47	797	31.105	6.198
121	71,544	-	-	1	-	1	-	-	-	750	-	750	13.977	10.483
122	123,200	-	-	1	2	3	70	-	-	1,800	139	1,939	24.351	15.739
123	246,561	-	-	2	1	3	50	-	-	4,800	50	4,850	12.167	19.671
124	73,125	-	-	1	2	3	14	-	-	1,500	27	1,527	41.026	20.882
125	29,589	-	-	1	1	2	68	-	-	1,125	68	1,193	67.593	40.319
126	38,980	1	-	1	2	4	43	6,000	-	300	85	6,385	102.617	163.802
Totals and averages 1945	13,002,439	2	-	13	184	199	27	12,000	-	13,875	4,974	30,849	15.305	2.373
1944	11,637,025	8	-	10	205	223	28	48,000	-	10,950	5,834	64,784	19.163	5.567

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F. fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

TABLE 12D. - Injury experience of each QUARRY enrolled in the National Safety Competition of 1944 1/

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	325,147	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
2	250,436	-	-	-	-	-	-	-	-	-	-	-	.000	.000
3	214,871	-	-	-	-	-	-	-	-	-	-	-	.000	.000
4	174,283	-	-	-	-	-	-	-	-	-	-	-	.000	.000
5	156,989	-	-	-	-	-	-	-	-	-	-	-	.000	.000
6	153,274	-	-	-	-	-	-	-	-	-	-	-	.000	.000
7	104,000	-	-	-	-	-	-	-	-	-	-	-	.000	.000
8	93,476	-	-	-	-	-	-	-	-	-	-	-	.000	.000
9	91,757	-	-	-	-	-	-	-	-	-	-	-	.000	.000
10	87,087	-	-	-	-	-	-	-	-	-	-	-	.000	.000
11	86,384	-	-	-	-	-	-	-	-	-	-	-	.000	.000
12	84,374	-	-	-	-	-	-	-	-	-	-	-	.000	.000
13	82,370	-	-	-	-	-	-	-	-	-	-	-	.000	.000
14	79,856	-	-	-	-	-	-	-	-	-	-	-	.000	.000
15	78,419	-	-	-	-	-	-	-	-	-	-	-	.000	.000
16	62,922	-	-	-	-	-	-	-	-	-	-	-	.000	.000
17	59,305	-	-	-	-	-	-	-	-	-	-	-	.000	.000
18	57,979	-	-	-	-	-	-	-	-	-	-	-	.000	.000
19	57,472	-	-	-	-	-	-	-	-	-	-	-	.000	.000
20	55,319	-	-	-	-	-	-	-	-	-	-	-	.000	.000
21	52,080	-	-	-	-	-	-	-	-	-	-	-	.000	.000
22	51,458	-	-	-	-	-	-	-	-	-	-	-	.000	.000
23	51,059	-	-	-	-	-	-	-	-	-	-	-	.000	.000
24	51,019	-	-	-	-	-	-	-	-	-	-	-	.000	.000
25	50,792	-	-	-	-	-	-	-	-	-	-	-	.000	.000
26	49,863	-	-	-	-	-	-	-	-	-	-	-	.000	.000
27	49,680	-	-	-	-	-	-	-	-	-	-	-	.000	.000
28	48,716	-	-	-	-	-	-	-	-	-	-	-	.000	.000
29	44,465	-	-	-	-	-	-	-	-	-	-	-	.000	.000
30	44,436	-	-	-	-	-	-	-	-	-	-	-	.000	.000
31	43,698	-	-	-	-	-	-	-	-	-	-	-	.000	.000
32	43,047	-	-	-	-	-	-	-	-	-	-	-	.000	.000
33	41,514	-	-	-	-	-	-	-	-	-	-	-	.000	.000
34	39,916	-	-	-	-	-	-	-	-	-	-	-	.000	.000
35	39,110	-	-	-	-	-	-	-	-	-	-	-	.000	.000
36	36,615	-	-	-	-	-	-	-	-	-	-	-	.000	.000
37	35,826	-	-	-	-	-	-	-	-	-	-	-	.000	.000
38	33,760	-	-	-	-	-	-	-	-	-	-	-	.000	.000
39	33,456	-	-	-	-	-	-	-	-	-	-	-	.000	.000
40	32,544	-	-	-	-	-	-	-	-	-	-	-	.000	.000
41	32,099	-	-	-	-	-	-	-	-	-	-	-	.000	.000
42	31,417	-	-	-	-	-	-	-	-	-	-	-	.000	.000
43	27,336	-	-	-	-	-	-	-	-	-	-	-	.000	.000
44	27,217	-	-	-	-	-	-	-	-	-	-	-	.000	.000
45	24,982	-	-	-	-	-	-	-	-	-	-	-	.000	.000
46	24,695	-	-	-	-	-	-	-	-	-	-	-	.000	.000
47	24,171	-	-	-	-	-	-	-	-	-	-	-	.000	.000
48	21,298	-	-	-	-	-	-	-	-	-	-	-	.000	.000
49	19,703	-	-	-	-	-	-	-	-	-	-	-	.000	.000
50	19,180	-	-	-	-	-	-	-	-	-	-	-	.000	.000
51	17,366	-	-	-	-	-	-	-	-	-	-	-	.000	.000
52	16,696	-	-	-	-	-	-	-	-	-	-	-	.000	.000
53	15,876	-	-	-	-	-	-	-	-	-	-	-	.000	.000
54	14,943	-	-	-	-	-	-	-	-	-	-	-	.000	.000
55	13,525	-	-	-	-	-	-	-	-	-	-	-	.000	.000
56	12,226	-	-	-	-	-	-	-	-	-	-	-	.000	.000
57	11,216	-	-	-	-	-	-	-	-	-	-	-	.000	.000
58	11,093	-	-	-	-	-	-	-	-	-	-	-	.000	.000
59	1,052,835	-	-	-	2	2	11	-	-	-	22	22	1.900	0.021
60	103,020	-	-	-	1	1	3	-	-	-	3	3	9.707	.029
61	64,760	-	-	-	1	1	3	-	-	-	3	3	15.442	.046
62	94,304	-	-	-	1	1	7	-	-	-	7	7	10.604	.074
63	306,731	-	-	-	1	1	29	-	-	-	29	29	3.260	.095
64	66,238	-	-	-	2	2	4	-	-	-	8	8	30.194	.121
65	409,613	-	-	-	1	1	69	-	-	-	69	69	2.441	.168
66	357,880	-	-	-	4	4	20	-	-	-	78	78	11.177	.218
67	42,127	-	-	-	1	1	12	-	-	-	12	12	23.738	.285
68	189,521	-	-	-	1	1	65	-	-	-	65	65	5.276	.343
69	198,947	-	-	-	4	4	19	-	-	-	76	76	20.106	.382
70	62,600	-	-	-	1	1	24	-	-	-	24	24	15.974	.383
71	25,418	-	-	-	1	1	10	-	-	-	10	10	39.342	.393
72	71,250	-	-	-	3	3	11	-	-	-	33	33	42.105	.463
73	101,129	-	-	-	9	9	5	-	-	-	47	47	88.995	.465

TABLE 12D. - Injury experience of each QUARRY enrolled in the National Safety Competition of 1944 1/ (Cont'd.)

Rank	Man-hours worked	Number of injuries 2/					Average days of disability per temp. injury	Number of days of disability 2/					Frequency rate 3/	Severity rate 3/
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
74	178,799	-	-	-	7	7	14	-	-	-	100	100	39.150	0.559
75	31,914	-	-	-	1	1	18	-	-	-	18	18	31.334	.564
76	130,844	-	-	-	4	4	19	-	-	-	76	76	30.571	.581
77	35,621	-	-	-	1	1	21	-	-	-	21	21	28.073	.590
78	73,761	-	-	-	1	1	48	-	-	-	48	48	13.557	.651
79	92,659	-	-	-	1	1	62	-	-	-	62	62	10.792	.669
80	17,950	-	-	-	1	1	13	-	-	-	13	13	55.710	.724
81	195,010	-	-	-	15	15	10	-	-	-	149	149	76.919	.764
82	29,778	-	-	-	1	1	25	-	-	-	25	25	33.582	.840
83	41,571	-	-	-	1	1	37	-	-	-	37	37	24.055	.890
84	65,631	-	-	-	2	2	35	-	-	-	69	69	30.473	1.051
85	426,735	-	-	-	11	11	43	-	-	-	476	476	25.777	1.115
86	23,250	-	-	-	1	1	26	-	-	-	26	26	43.011	1.118
87	180,911	-	-	-	9	9	23	-	-	-	209	209	49.748	1.155
88	128,796	-	-	-	8	8	19	-	-	-	151	151	62.114	1.172
89	225,394	-	-	-	21	21	13	-	-	-	278	278	93.170	1.233
90	126,290	-	-	-	5	5	32	-	-	-	158	158	39.591	1.251
91	72,737	-	-	-	8	8	14	-	-	-	108	108	109.985	1.485
92	71,231	-	-	-	2	2	58	-	-	-	116	116	28.078	1.629
93	86,243	-	-	-	2	2	80	-	-	-	159	159	23.190	1.844
94	685,740	-	-	2	8	10	93	-	-	600	740	1,340	14.583	1.954
95	325,953	-	-	1	2	3	26	-	-	600	51	651	9.204	1.997
96	104,408	-	-	-	2	2	106	-	-	-	211	211	19.156	2.021
97	97,340	-	-	-	6	6	40	-	-	-	242	242	61.640	2.486
98	13,279	-	-	-	3	3	12	-	-	-	35	35	225.921	2.636
99	52,966	-	-	-	7	7	27	-	-	-	186	186	132.160	3.512
100	29,639	-	-	-	1	1	110	-	-	-	110	110	33.739	3.711
101	40,959	-	-	-	5	5	31	-	-	-	155	155	122.073	3.784
102	87,435	-	-	1	2	3	16	-	-	300	31	331	34.311	3.786
103	136,080	-	-	1	2	3	10	-	-	750	20	770	22.045	5.658
104	233,917	-	-	1	-	1	-	-	-	1,800	-	1,800	4.275	7.695
105	28,317	-	-	-	1	1	300	-	-	-	300	300	35.314	10.594
106	17,413	-	-	1	1	2	124	-	-	300	124	424	114.857	24.350
107	144,818	-	-	1	6	7	72	-	-	4,500	433	4,933	48.337	34.063
108	143,073	1	-	-	2	3	34	6,000	-	-	68	6,068	20.968	42.412
109	228,680	2	-	1	8	11	11	12,000	-	300	90	12,390	48.102	54.181
110	28,005	-	-	1	-	1	-	-	-	1,800	-	1,800	35.708	64.274
111	79,170	1	-	-	7	8	13	6,000	-	-	93	6,093	101.048	76.961
112	55,052	1	-	-	1	2	54	6,000	-	-	54	6,054	36.329	109.969
113	46,241	1	-	-	6	7	18	6,000	-	-	106	6,106	151.381	132.047
114	42,245	1	-	-	-	1	-	6,000	-	-	-	6,000	23.671	142.029
115	40,984	1	-	-	-	1	-	6,000	-	-	-	6,000	24.400	146.399
Totals and averages 1944	11,637,025	8	0	10	205	223	28	48,000	0	10,950	5,834	64,784	19.163	5.567
1943	15,789,247	12	0	13	261	286	27	72,000	0	14,290	71,43	93,433	18.114	5.918

1/ As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the plants to which this table relates are not revealed.

2/ F. fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

3/ Frequency rate indicates the number of fatal, permanent, and other lost-time injuries per million man-hours of exposure; severity rate indicates number of days of disability from injuries per thousand man-hours.

OUTSTANDING INJURY-FREE RECORDS

Winners of awards in the National Safety Competitions of the past 4 years have been listed in the preceding sections of this report. Among the participants, however, there are certain mines and quarries that have had safety records that merit special consideration. The following limitations have been set up to facilitate the selection of plants that have achieved outstanding injury-free records:

1. The plant must have operated at least 400,000 man-hours without a lost-time injury
2. The injury-free record must have been achieved while the operation was enrolled in the National Safety Competition. In other words, if the record resulted from operation over a period of years, it is required that the plant must have been enrolled continuously during the period.

Recognition of outstanding injury-free records, subject to the foregoing limitations, supplements to some extent the lists of award winners, in that perfect safety records that extend over a period of years receive consideration. Several of the smaller plants have been awarded Certificates of Achievement in Safety year after year, but they can not qualify as winners of the "Sentinels of Safety" trophies because their yearly total man-hours of operation is too low.

It is possible that certain plants may not be listed despite the fact that they have outstanding injury-free records, as the records of the National Safety Competition are compiled on a calendar-year basis. For example, a mine or quarry might have operated the required number of injury free man-hours within a year in which it had one or more injuries. At the same time, it would be well to note that participants in the National Safety Competition comprise only a part of the mineral-mining industry; hence it is possible that some mines and quarries that are not enrolled in the competition have outstanding safety records. Although this publication covers the safety competitions of 1947, 1946, 1945, and 1944, only mines and quarries that have "outstanding injury-free records" that extend through 1947 will be listed.

Following is a list of mines and quarries enrolled in the National Safety Competition of 1947 that worked 400,000 or more man-hours, including man-hours through 1947, without a disabling injury:

The Mahoning iron-ore open-pit, Hibbing, St. Louis County, Minn., operated by Pickands, Mather & Co. (Mahoning Ore & Steel Co.), was in operation 3 years, January 1, 1945, to December 31, 1947, without a lost-time injury. This mine worked 1,000,864 man-hours during this period.

The Clinchfield limestone quarry, Clinchfield, Houston County, Ga., operated by the Pennsylvania-Dixie Cement Corp., was in operation 16 years, January 1, 1932 to December 31, 1947, without a lost-time injury. This quarry worked 907,063 man-hours during the period.

The phosphate matrix open pit, Columbia, Maury County, Tenn., operated by the Monsanto Chemical Co., was in operation 5 years, January 1, 1943, to December 31, 1947, without a lost-time injury. This mine worked 626,605 man-hours during this period.

The Bethlehem limestone quarry, Bethlehem, Northampton County, Pa., operated by the Bethlehem Steel Co., was in operation 4 years, January 1, 1944, to December 31, 1947, without a lost-time injury. This quarry worked 589,218 man-hours during this period.

The Winton No. 1 & 7½ underground bituminous-coal mine, Winton, Sweetwater County, Wyo., operated by The Union Pacific Coal Co., was in operation 587,342 man-hours during 1947 without a lost-time injury.

The Sagamore iron-ore open pit, Riverton, Crow Wing County, Minn., operated by Pickands, Mather & Co. (Sagamore Ore Mining Co.), was in operation 3 years, January 1, 1945, to December 31, 1947, without a lost-time injury. This mine worked 539,726 man-hours during this period.

The Soudan underground iron-ore mine, Soudan, St. Louis County, Minn., operated by the Oliver Iron Mining Co., was in operation 527,595 man-hours during 1947 without a lost-time injury.

The Volunteer iron-ore open pit, Palmer, Marquette County, Mich., operated by Pickands, Mather & Co. (Palmer Mining Co.), was in operation 12 year, January 1, 1936, to December 31, 1947, without a lost-time injury. This mine worked 521,260 man-hours during this period.

The Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Co., was in operation 5 years, January 1, 1943, to December 31, 1947, without a lost-time injury. This quarry worked 518,410 man-hours during this period.

The Dallas limestone quarry, Dallas, Dallas County, Tex., operated by the Lone Star Cement Corp., was in operation 14 years, January 1, 1934, to December 31, 1947, without a lost-time injury. This quarry worked 513,888 man-hours during this period.

The Medusa limestone quarry, York, York County, Pa., operated by the Medusa Portland Cement Co., was in operation 13 years, January 1, 1935, to December 31, 1947, without a lost-time injury. This quarry worked 484,236 man-hours during this period.

The Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by the Marquette Cement Manufacturing Co., was in operation 6 years, January 1, 1942, to December 31, 1947, without a lost-time injury. This quarry operated 463,939 man-hours during this period.

The St. Stephens limestone quarry, St. Stephens, Washington County, Ala., operated by the Lone Star Cement Corp., worked 4 years, January 1, 1944, through December 31, 1947, without a lost-time injury. The total man-hours of operation during this period was 436,633.

The St. Paul iron-ore open-pit, Keewatin, Itasca County, Minn., operated by the Republic Steel Corp., was in operation 4 years, January 1, 1944, to December 31, 1947, without a lost-time injury. This mine operated 420,962 man-hours during the period.

GENERAL SUMMARY

The foregoing sections contain the statistical data pertaining to the six industry groups and to the individual operations that make up these groups in the National Safety Competition. Summary tables portraying the aggregate injury experience of all groups will be included in this section. These statistical tables, as well as the tables summarizing the injury experience of the six industry groups, are not directly applicable to the mineral industry as a whole. Through the years, the fact that mines and quarries enrolled in the competition have, on the average, better safety records than mines and quarries not entered has been demonstrated conclusively. Numerous examples can be cited to substantiate this observation. In the bituminous-coal group, the injury-frequency rate in 1944 was 40.718, whereas the corresponding rate for the industry's deep mines was 64.580. The same group had an injury-frequency rate of 43.239 in 1943, whereas the rate for the industry was 68.806. Statistical data presenting the injury experience of entrants in the National Safety Competition relate to plants that manifest an extraordinary interest in the promotion of safety. Table 13 records the approximate percentage of each industry, based upon man-hours worked, represented by the enrollment of the competition.

The injury experience of all mines and quarries enrolled in the National Safety Competition is summarized by years in table 14, which constitutes a statistical history of the competition. The number of participants has grown from 210 in 1925 to a record 494 in 1946. Although there were 18 fewer contestants in 1947, the high level of operation of the enrolled plants is illustrated by the fact that they worked 160,525,025 man-hours, a total considerably greater than that of any previous year. In addition to the fact that the number of participants varies from year to year, it should also be pointed out that there is a slight turn-over within each group. Therefore, in comparing the safety record of one year with that of another, cognizance must be taken of the fact that the plants that comprise the groups are not identical from year to year.

The aggregate injury experience of entrants in the National Safety Competitions of the past 4 years indicates that definite progress in the promotion of safety is being made. Despite the difficulties that confronted the mineral industries during this period, the safety record of all mines and quarries in the competition is commendable. The injury-severity rate of 8.060 in 1944 was the second lowest in the history of the competition prior to that time. The rate increased during the next 2 years, but in 1947 it fell to 7.315, the lowest in the 23 years of competition. As the injury-severity rate is the measurement of the degree to which the mineral industry has overcome the hazards of mining, this performance is especially significant.

Despite the low severity rates for the period, the injury-frequency rates for the period are very high. In the first 3 years, the frequency rate rose gradually to 50.577 in 1946, which was the highest since 1933. However, the rate of 42.155 in 1947 marks a significant turn downward in the frequency rate.

It is conceivable that the favorable performance of enrollees in the competition of 1947 indicates that the impediments to safety encountered during the war and in the reconversion period are being overcome.

Table 15 is a summary of the injury-frequency rates of the six industry groups, by degree of injury, for the years 1937 to 1947, whereas table 16 classifies the injury-severity rates for the same period. Table 17 records the average number of days of disability resulting from temporary injuries in all mines and quarries during the period 1929 to 1947. The gradual decline in average number of days of disability since the high of 39.6 days in 1938 continued during the 4-year period of this report. In fact, the 28.9-day average of 1947 is the lowest since 1933.

Progress in the promotion of safety is shown clearly through the records of contestants in the National Safety Competition of 1947. To sum up, the following are the highlights of the contest:

First, the injury-severity rate of 7.315 was the lowest in the 23 year history of the competition;

Second, the injury-frequency rate of 42.155 was the lowest since 1943; and

Third, the average number of days of disability from temporary injuries was 28.9 days, the lowest since 1933.

TABLE 13. - Approximate percentage of each industry, based upon man-hours worked, represented by the enrollment in the National Safety Competition, 1931-46, by years

Year	Anthracite 1/	Bituminous coal 2/	Metal	Nonmetal	Open-pit	Quarry
1931	8	5	10	14	22	21
1932	11	6	9	13	21	19
1933	15	6	10	11	13	25
1934	10	7	11	13	12	27
1935	17	7	7	15	7	22
1936	16	7	7	15	8	22
1937	14	6	9	19	10	23
1938	13	7	10	18	13	23
1939	14	8	11	19	17	23
1940	14	8	12	19	17	20
1941	14	8	15	23	14	22
1942	16	9	18	27	13	25
1943	19	7	20	19	14	22
1944	28	6	16	19	11	19
1945	30	7	16	21	13	22
1946	29	10	12	23	12	23

1/ Figures do not include man-hours and injuries for dredges, washeries, breakers, power plants or boiler rooms.

2/ Beginning 1945, portal to portal basis.

TABLE 14. - Injury experience of all groups in the National Safety Competition, 1925-47, by years.

Year	Number of mines	Man-hours	Fatal injuries	Non-fatal injuries	Total	Days of dis-ability	Frequency rate	Severity rate
1925	210	68,418,283	68	6,780	6,848	580,895	100.090	8.490
1926	256	95,055,815	93	7,220	7,313	799,493	76.934	8.411
1927	256	91,919,812	104	6,541	6,645	866,021	72.291	9.421
1928	284	91,746,707	110	5,999	6,109	900,182	66.585	9.812
1929	311	106,533,006	114	6,954	7,068	986,306	66.346	9.258
1930	1/ 337	96,533,706	102	5,869	5,971	849,778	61.854	8.803
1931	350	79,544,551	76	3,871	3,947	692,092	49.620	8.701
1932	322	68,081,721	66	3,763	3,829	585,481	56.241	8.600
1933	332	78,826,713	75	4,569	4,644	701,593	58.914	8.900
1934	2/ 333	81,759,857	66	3,668	3,734	628,905	45.670	7.692
1935	336	91,978,874	101	4,344	4,445	915,360	48.326	9.952
1936	328	100,472,906	92	4,164	4,256	876,338	42.360	8.722
1937	318	99,519,046	87	3,693	3,780	811,161	37.983	8.151
1938	3/ 342	85,321,573	76	3,081	3,157	725,326	37.001	8.501
1939	360	105,881,504	102	3,691	3,793	946,589	35.823	8.940
1940	362	112,695,106	106	3,615	3,721	981,902	33.018	8.713
1941	4/ 401	133,068,010	112	4,667	4,779	1,128,396	35.914	8.480
1942	5/ 432	160,878,192	165	7,479	7,644	1,531,623	47.514	9.520
1943	6/ 388	142,432,236	127	5,776	5,903	1,168,799	41.444	8.206
1944	373	138,297,789	121	6,507	6,628	1,114,639	47.926	8.060
1945	7/ 432	141,982,344	147	6,760	6,907	1,315,495	48.647	9.265
1946	494	152,738,374	142	7,583	7,725	1,341,843	50.577	8.785
1947	476	160,525,025	125	6,642	6,767	1,174,228	42.155	7.315

1/ Omitting the entire record of 1 mine, in which 73 lives were lost in a single disaster.
2/ Omitting the entire record of 1 mine, in which 17 lives were lost in a single disaster.
3/ Omitting the entire record of 3 mines, in which 24 lives were lost in 3 disasters.
4/ Omitting the entire record of 1 mine, in which 5 lives were lost in a single disaster.
5/ Omitting the entire record of 1 quarry, in which 28 lives were lost in a single disaster.
6/ Omitting the entire record of 1 mine, in which 12 lives were lost in a single disaster.
7/ Omitting the entire record of 1 mine, in which 7 lives were lost in a single disaster.

TABLE 15. - Injury-frequency rates for all groups in the National Safety Competition, by degree of injury, 1937-47, by years

Type of mine	Degree of injury	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947
Anthracite...	**Fatal**	1.506	1.091	1.689	1.108	0.876	1.223	1.372	.987	1.267	1.204	.966
	P.T.	.112	.136	.120	.000	.058	.047	.076	.050	.000	.027	.000
	P.P.	.948	1.569	.965	1.293	1.869	1.176	1.106	.938	.873	1.230	1.346
	Temp.	84.548	83.890	69.846	76.275	76.173	89.000	85.451	85.243	86.947	88.592	90.296
	Total	87.114	86.686	72.620	78.676	78.976	91.446	88.005	87.218	89.087	91.053	92.608
Bituminous...	**Fatal**	.786	1.281	1.131	1.218	1.122	1.509	.928	1.152	1.347	1.039	.802
	P.T.	.025	.063	.068	.105	.114	.060	.041	.061	.053	.149	.094
	P.P.	3.855	3.561	3.529	3.276	3.422	3.317	2.681	1.921	2.240	1.603	2.353
	Temp.	33.475	35.488	39.249	32.132	36.293	56.123	39.589	37.584	41.782	42.296	33.794
	Total	38.141	40.393	43.947	36.731	40.951	61.009	43.239	40.718	45.422	45.087	37.043
Metal........	**Fatal**	.835	.690	.737	.853	.973	.749	.721	.595	.833	1.204	.879
	P.T.	.000	.000	.053	.045	.067	.000	.030	.000	.055	.000	.000
	P.P.	1.669	2.256	1.631	2.065	1.845	1.768	1.381	1.685	1.332	2.007	1.570
	Temp.	18.245	18.864	14.258	13.336	22.709	21.099	22.074	23.140	29.140	37.811	36.418
	Total	20.749	21.810	16.679	16.299	25.594	23.616	24.206	25.420	31.360	41.022	38.867
Nonmetal.....	**Fatal**	.813	.000	.657	.300	.224	.697	.222	.459	1.145	.938	1.697
	P.T.	.271	.000	.000	.000	.000	.000	.000	.000	.000	.188	.000
	P.P.	1.085	.348	1.315	1.200	2.239	1.220	1.996	1.147	1.603	2.063	1.273
	Temp.	13.282	11.134	12.815	13.802	19.256	34.515	30.606	37.172	30.690	31.513	25.455
	Total	15.451	11.482	14.787	15.302	21.719	36.432	32.824	38.778	33.438	34.702	28.425
Open-pit.....	**Fatal**	.594	.180	.242	.417	.265	.314	.638	.165	.216	.377	.234
	P.T.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.075	.000
	P.P.	.594	.539	.849	.625	.797	.627	.922	.412	.718	.829	.409
	Temp.	11.488	3.592	10.552	9.177	7.527	11.836	16.666	13.838	16.083	18.911	13.154
	Total	12.676	4.311	11.643	10.219	8.589	12.777	18.226	14.415	17.017	20.192	13.797
Quarry.......	**Fatal**	.541	.491	.405	.440	.281	.240	.760	.688	.154	.118	.579
	P.T.	.000	.000	.068	.073	.056	.096	.000	.000	.000	.000	.000
	P.P.	.781	.632	.676	.733	1.069	.720	.824	.859	1.000	1.063	.632
	Temp.	13.396	12.069	11.484	12.095	16.367	20.878	16.530	17.616	14.151	17.716	15.796
	Total	14.718	13.192	12.633	13.341	17.773	21.934	18.114	19.163	15.305	18.897	17.007
Grand total..	**Fatal**	.874	.891	.963	.941	.842	1.026	.892	.875	1.036	.930	.779
	P.T.	.040	.047	.066	.062	.075	.043	.035	.036	.028	.085	.043
	P.P.	2.181	2.180	2.116	2.156	2.292	2.088	1.685	1.352	1.500	1.434	1.651
	Temp.	34.888	33.883	32.678	29.859	32.705	44.357	38.832	45.663	46.083	48.128	39.682
	Total	37.983	37.001	35.823	33.018	35.914	47.514	41.444	47.926	48.647	50.577	42.155

TABLE 16. - Injury-severity rates for groups in the National Safety Competition, by degree of injury, 1937-47, by years

Type of mine	Degree of injury	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947
Anthracite..	Fatal	9.035	6.547	10.133	6.649	5.257	7.338	8.233	5.923	7.602	7.222	5.797
	P.T.	.669	.818	.724	.000	.351	.282	.457	.296	.000	.161	.000
	P.P.	.611	.737	.887	1.261	1.989	1.059	.955	.785	.803	1.296	.901
	Temp.	2.683	2.827	2.278	2.494	2.131	2.788	2.248	2.104	2.423	2.219	2.183
	Total	12.998	10.929	14.022	10.404	9.728	11.467	11.893	9.108	10.828	10.898	8.881
Bituminous..	Fatal	4.717	7.685	6.787	7.309	6.730	9.055	5.567	6.914	8.084	6.235	4.813
	P.T.	.152	.375	.407	.630	.685	.359	.248	.364	.315	.891	.561
	P.P.	2.465	2.558	2.150	2.323	2.257	2.634	2.387	1.750	2.235	1.502	1.809
	Temp.	1.303	1.658	1.568	1.265	1.575	1.811	1.399	1.409	1.532	1.553	1.214
	Total	8.637	12.276	10.912	11.527	11.247	13.859	9.601	10.437	12.166	10.181	8.397
Metal.......	Fatal	5.008	4.136	4.420	5.119	5.837	4.495	4.324	3.568	4.995	7.225	5.274
	P.T.	.000	.000	.316	.269	.402	.000	.054	.000	.333	.000	.000
	P.P.	.796	1.287	1.540	1.291	1.364	1.423	1.172	1.462	.974	1.229	.899
	Temp.	.884	.730	.493	.606	.795	.789	.723	.865	1.046	.912	.790
	Total	6.688	6.153	6.769	7.285	8.398	6.707	6.273	5.895	7.348	9.366	6.963
Nonmetal....	Fatal	4.879	.000	3.943	1.800	1.343	4.184	1.331	2.754	6.871	5.627	10.182
	P.T.	1.626	.000	.000	.000	.000	.000	.000	.000	.000	1.126	.000
	P.P.	1.464	.104	.680	1.620	3.527	1.446	1.569	1.273	1.168	1.008	1.015
	Temp.	.439	.440	.408	.622	.513	.817	.752	.890	.739	.789	.701
	Total	8.408	.544	5.031	4.042	5.383	6.447	3.652	4.917	8.778	8.550	11.898
Open-pit....	Fatal	3.565	1.078	1.455	2.503	1.594	1.881	3.829	.989	1.292	2.260	1.403
	P.T.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.452	.000
	P.P.	1.070	.929	.801	.501	.797	.412	.886	.568	.773	.695	.369
	Temp.	.373	.111	.238	.343	.272	.231	.415	.435	.379	.601	.359
	Total	5.008	2.118	2.494	3.347	2.663	2.524	5.130	1.992	2.444	4.008	2.131
Quarry......	Fatal	3.244	2.947	2.432	2.639	1.687	1.440	4.560	4.125	.923	.709	3.475
	P.T.	.000	.000	.405	.440	.338	.576	.000	.000	.000	.000	.000
	P.P.	.461	.853	1.358	.611	1.313	.634	.905	.941	1.067	.791	.600
	Temp.	.443	.451	.346	.431	.364	.583	.453	.501	.383	.461	.414
	Total	4.148	4.251	4.541	4.121	3.702	3.233	5.918	5.567	2.373	1.961	4.489
Grand total.	Fatal	5.245	5.344	5.780	5.643	5.050	6.154	5.350	5.250	6.212	5.578	4.672
	P.T.	.241	.281	.397	.373	.451	.261	.181	.217	.169	.511	.262
	P.P.	1.407	1.534	1.585	1.583	1.815	1.697	1.500	1.238	1.434	1.263	1.235
	Temp.	1.258	1.342	1.178	1.114	1.164	1.408	1.175	1.355	1.450	1.433	1.146
	Total	8.151	8.501	8.940	8.713	8.480	9.520	8.206	8.060	9.265	8.785	7.315

TABLE 17. - Average number of days of disability for each temporary injury in all groups in the National Safety Competition, 1929-47, by years

Index 1929 = 100

	Anthracite		Bituminous		Metal		Nonmetal		Open-pit		Quarry		Total	
	Days	Index	Days	Index	Days	Index	Days	Index	Days	Index	Days	Index	Days	Index
1929	18.1	100.0	27.5	100.0	20.9	100.0	21.6	100.0	12.3	100.0	18.6	100.0	21.6	100.0
1930	18.1	100.0	25.6	93.1	33.2	158.9	29.6	137.0	18.5	150.4	17.3	93.0	21.6	100.0
1931	16.3	90.1	26.9	97.8	33.7	161.2	30.8	142.6	27.4	222.8	20.8	111.8	23.5	108.8
1932	20.3	112.2	31.9	116.0	43.3	207.2	31.8	147.2	21.0	170.7	31.0	166.7	27.0	125.0
1933	22.7	125.4	30.5	110.9	32.2	154.1	33.3	154.2	15.6	126.8	27.5	147.8	26.0	120.4
1934	23.7	130.9	34.7	126.2	35.9	171.8	26.9	124.5	29.3	238.2	18.3	98.4	29.8	138.0
1935	26.1	144.2	37.3	135.6	34.9	167.0	49.8	230.6	27.2	221.1	33.3	179.0	32.4	150.0
1936	29.6	163.5	37.3	135.6	51.9	248.3	24.5	113.4	26.1	212.2	26.6	143.0	33.3	154.2
1937	31.7	175.1	38.9	141.5	48.4	231.6	33.0	152.8	32.5	264.2	33.1	178.0	36.1	167.1
1938	33.7	186.2	46.7	169.8	38.7	185.2	39.5	182.9	30.9	251.2	37.4	201.1	39.6	183.3
1939	32.6	180.1	39.9	145.1	34.6	165.6	31.8	147.2	22.6	183.7	30.2	162.4	36.1	167.1
1940	32.7	180.7	39.4	143.3	45.4	217.2	45.0	208.3	37.4	304.1	35.7	191.9	37.3	172.7
1941	28.0	154.7	43.4	157.8	35.0	167.5	26.6	123.1	36.2	294.3	22.2	119.4	35.6	164.8
1942	31.3	172.9	32.3	117.5	37.4	178.9	23.7	109.7	19.5	158.5	27.9	150.0	31.8	147.2
1943	26.3	145.3	35.3	128.4	32.7	156.5	24.6	113.9	24.9	202.4	27.4	147.3	30.2	139.8
1944	24.7	136.5	37.5	136.4	37.4	178.9	23.9	110.6	31.4	255.3	28.5	153.2	29.7	137.5
1945	27.9	154.1	36.7	133.5	35.9	171.8	24.1	111.6	23.6	191.9	27.0	145.2	31.5	145.8
1946	25.1	138.7	36.7	133.5	24.1	115.3	25.0	115.7	31.8	258.5	26.1	140.3	29.8	138.0
1947	24.2	133.7	35.9	130.5	21.7	103.8	27.5	127.3	27.3	222.0	26.2	140.9	28.9	133.8